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ABSTRACT

This first aid manual is designed to serve as basic first aid instructional materials for all nonmedical naval personnel. Chapters are included on the following topics: basic life support, hemorrhage, shock, wounds, injuries, drug abuse, poisoning, common medical emergencies, NBC (nuclear, biological, chemical) agent casualties, and rescue and transportation procedures. (CS)

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STANDARD FIRST AID TRAINING COURSE

NAVAL EDUCATION AND TRAINING COMMAND

RATE TRAINING MANUAL

NAVEDTRA 10081-C

SE 034 568

Although the words "he", "him", and "his", are used sparingly in this manual to enhance communication, they are not intended to be gender driven nor to affront or discriminate against anyone reading *Standard First Aid Training Course*, NAVEDTRA 10081-C.

PREFACE

This First Aid Manual and Nonresident Career Course (NRCC) are designed to serve as basic first aid instructional materials for all nonmedical naval personnel. The course may be used for individual study as well as for group instruction.

The assignment booklet for the NRCC contains learning objectives, multiple-choice questions, and situational problems designed to guide the student systematically through the manual. Critical information and basic principles of treatment are reinforced throughout the course.

A *Standard First Aid Training Course Instructor Syllabus*, NAVEDTRA 10081-C, has been developed to assist command-designated first aid instructors in training all nonmedical naval personnel in the principles of first aid. The syllabus contains learning objectives, instructor outlines and strategy, and references.

By using the total program, personnel assigned to teach basic first aid will be able to present the subject matter in an effective manner. Instructors should become thoroughly familiar with program contents, prepare carefully for each presentation, and adapt their delivery to each particular group.

This training course was revised by the Naval Health Sciences Education and Training Command, under the supervision of the Bureau of Medicine and Surgery, for the Chief of Naval Education and Training.

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THE UNITED STATES NAVY

GUARDIAN OF OUR COUNTRY

The United States Navy is responsible for maintaining control of the sea and is a ready force on watch at home and overseas, capable of strong action to preserve the peace or of instant offensive action to win in war.

It is upon the maintenance of this control that our country's glorious future depends; the United States Navy exists to make it so.

WE SERVE WITH HONOR

Tradition, valor, and victory are the Navy's heritage from the past. To these may be added dedication, discipline, and vigilance as the watchwords of the present and the future.

At home or on distant stations we serve with pride, confident in the respect of our country, our shipmates, and our families.

Our responsibilities sober us; our adversities strengthen us.

Service to God and Country is our special privilege. We serve with honor.

THE FUTURE OF THE NAVY

The Navy will always employ new weapons, new techniques, and greater power to protect and defend the United States on the sea, under the sea, and in the air.

Now and in the future, control of the sea gives the United States her greatest advantage for the maintenance of peace and for victory in war.

Mobility, surprise, dispersal, and offensive power are the keynotes of the new Navy. The roots of the Navy lie in a strong belief in the future, in continued dedication to our tasks, and in reflection on our heritage from the past.

Never have our opportunities and our responsibilities been greater.

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CHAPTER 1

INTRODUCTION TO FIRST AID

First aid is the emergency care given sick or injured persons. Emergency care must not take the place of proper medical or surgical treatment, but should consist ONLY of furnishing temporary assistance until competent medical aid is available.

The purposes of first aid are: (1) to save life, (2) to prevent further injury, and (3) to preserve vitality and resistance to infection.

Everyone in the Navy must know when and how to apply first aid measures and be prepared to give competent assistance to persons injured in battle, collision, fire, and other accidents that may occur on land, sea, or in the air. A real knowledge of first aid and its purposes, when properly applied, may mean the difference between life and death, between rapid recovery and long hospitalization, between temporary disability and permanent injury.

In administering first aid, you have three primary tasks:

1. Maintain breathing.
2. Stop severe bleeding.
3. Prevent or reduce shock.

Work quickly, but don't rush around frantically. Don't waste time looking for readymade materials; do the best you can with whatever is at hand. Send for medical help as soon as possible.

GENERAL FIRST AID RULES

Although each case of injury or sickness presents its own special problems, there are some general rules that apply to practically all situations. You should have a thorough understanding of the following rules before going on to learn specific first aid treatment for various types of injuries:

1. Keep the victim lying down, his head level with his body, until you have found out what kind of injury he has and how serious it is. However, it should be quickly noted if the victim has one of the following problems that represent exceptions to this rule and require different positions.

a. Vomiting or Bleeding About the Mouth and Semiconscious.–If the victim is in danger of sucking in blood, vomited matter, or water, place him on his side or on his back with his head turned to one side, lower than his feet.

b. Shortness of Breath.–If the victim has a chest injury or breathing difficulties, place him in a sitting or semisitting position.

c. Severe Shock.–If the victim is in severe shock, place him on his back with his head slightly lower than his feet.

2. In examining the victim, move him no more than is absolutely necessary. It may be necessary to remove some of his clothing in order to determine the extent of his injuries. Remove enough clothing to get a clear idea of the extent of the injury. If done incorrectly, removing clothing may do great harm, especially in fracture injuries. If necessary rip or cut clothing along the seams. When clothing is removed, insure that the victim does not become chilled. Shoes may have to be cut off to avoid causing pain or increasing an injury.

3. Keep the victim reassured and as comfortable as possible. Often a restoration of confidence is very helpful. Avoid allowing the victim to see his injury. Assure him that his injuries are understood and that he will get medical attention as soon as possible.

4. Do not touch open wounds or burns with fingers or other objects, except when sterile compresses or bandages are not available and it is absolutely necessary to stop severe bleeding.

5. Do not try to give an unconscious person any solid or liquid substance by mouth. He may vomit and get some of the material into his lungs when he breathes, causing choking. Death could result.

6. If a bone is broken, or you suspect that one is broken, do not move him until you have immobilized the injured part. This may prove lifesaving in cases of severe bone fractures, or spinal cord injuries, for the jagged bone may sever nerves and blood vessels, damage tissues, and increase shock. Of course, threat of fire, necessity to abandon ship, and other similar situations may require that the victim be moved. But the principle should always be kept firmly in mind and considered against other factors.

7. When transporting an injured person, always see that the litter is carried feet forward no matter what injuries he has. This will enable the rear bearer to observe the victim for any respiratory obstruction or stoppage of breathing.

8. Keep the injured person comfortably warm—warm enough to maintain normal body temperature.

Very serious and mutilating injuries may require heroic first aid measures on your part; but by far the greater number of injuries will require a minimum of effort on your part and a maximum of judgment and self-control to prevent yourself and well-intentioned bystanders from trying to do too much.

CHAPTER 2

BASIC LIFE SUPPORT

A person who has stopped breathing is not necessarily dead, but he is in immediate, critical danger. Life is dependent upon oxygen, which is breathed into the lungs and then carried by the blood to every body cell. Since body cells cannot store oxygen, and since the blood can hold only a limited amount (and that only for a short time), death will surely result from continued lack of breathing.

However, the heart may continue to beat for some time after breathing has stopped, and the blood may still be circulated to the body cells. Since the blood will, for a short time, contain a small supply of oxygen, the body cells will not die immediately. Thus, for a very few minutes, there is some chance that the person's life may be saved. A person who has stopped breathing but who is still alive is said to be in a state of respiratory failure. The first aid treatment for respiratory failure is called ARTIFICIAL VENTILATION.

If a person has no heartbeat he is said to be in CARDIAC ARREST. Stoppage of the heart is soon followed by respiratory failure, unless failure to breathe has occurred first. A person who has no heart beat must be given external cardiac massage immediately (discussed later under cardiopulmonary resuscitation–CPR). If a situation of respiratory failure is not corrected, cardiac arrest will occur very quickly.

CAUSES OF RESPIRATORY FAILURE

Most causes of respiratory failure found in emergency situations are the result of one of the following:

1. Insufficient oxygen in the air
2. Inability of the blood to carry oxygen
3. Paralysis of the breathing center in the brain
4. Compression of the body
5. Airway blockage

INSUFFICIENT OXYGEN IN THE AIR

Even if the air passages are not blocked, respiratory failure may occur because of insufficient oxygen in the air. For example, aviators and mountain climbers sometimes experience respiratory problems because there is not enough oxygen in the air at high altitudes. The supply of oxygen in unventilated spaces aboard ship, such as voids, tanks, and double bottoms, is frequently too small to support life. Similarly, on shore, places which are not well ventilated–cisterns, sewers, old wells, unused basements, silos, abandoned mines–may be dangerously deficient in oxygen. (Another danger of such places is that they may contain poisonous or explosive gases. Before anyone is allowed to go down to work in places of this kind, the air must be tested to be sure that it is safe.) Another cause of poor oxygen supply may be that other gases take the place of the oxygen. For example, a fire in any closed space results in the formation of carbon dioxide and a consequent reduction in the amount of oxygen. (The amount of carbon dioxide in the air is greatly increased, if you use a carbon dioxide extinguisher to put out the fire.) If there is not enough oxygen available, unconsciousness will occur suddenly and breathing will stop.

9

INABILITY OF THE BLOOD TO CARRY OXYGEN

Carbon monoxide poisoning is the primary example of respiratory failure due to an inability of the blood to carry oxygen. Carbon monoxide is a colorless, odorless, and tasteless gas which gives no warning of its presence. Even a small amount of it can be very dangerous. Carbon monoxide is present in engine exhaust gases, manufactured gases used for cooking and heating, sewer gases, gases used for or resulting from industrial processes, and many other gases. It is produced by any fire, but particularly those in which coal, coke, oil, or gasoline are burned. It is also produced by decomposition; for example, food decaying in the hold of a ship may produce enough carbon monoxide to poison anyone who goes into the space. Carbon monoxide bonds with the hemoglobin of the blood, preventing oxygen from being carried to the cells.

PARALYSIS OF THE BREATHING CENTER OF THE BRAIN

Breathing can also be stopped by paralysis of the breathing center in the brain. The most frequent causes of paralysis of the breathing center are electric shock, excessive amounts of alcohol, drugs, anesthetics, and breathing too much carbon dioxide. Also, some frequently used solvents, such as carbon tetrachloride, affect the breathing center and cause breathing to stop.

COMPRESSION OF THE BODY

Since breathing movements cannot be made against any great amount of pressure, compression of the body can easily stop a person's breathing. Accidental burial in dirt, sand, gravel, coal, cinders, or similar material is likely to cause respiratory failure because of body compression. In such cases death may occur even though the nose and mouth are uncovered.

In many cases of respiratory failure, it is necessary to rescue the victim before you can begin first aid treatment. If you find it necessary to rescue a person from any dangerous situation, remember that the danger may still exist. Take all possible measures to protect yourself. Speed is important, but a careful evaluation of the situation is essential. A few moments' thought may make the difference between life and death, for you, as well as for the person you are trying to rescue.

AIRWAY BLOCKAGE

To check for breathing, look for chest movement or put your ear next to the victim's nose and mouth to listen and feel for breath. If the victim needs assistance in breathing, first clear the mouth of any food particles, foreign objects, or loose dentures. Do this by sweeping the mouth clean with your fingers.

When a victim becomes unconscious, the muscles relax and the tongue may slide back into the airway blocking it as illustrated in figure 2-1. To open the airway in this situation, the head or jaw tilt technique is recommended.

Head Tilt

The head tilt technique is performed with the victim on his back and the rescuer kneeling at his side—head and neck level with the victim.

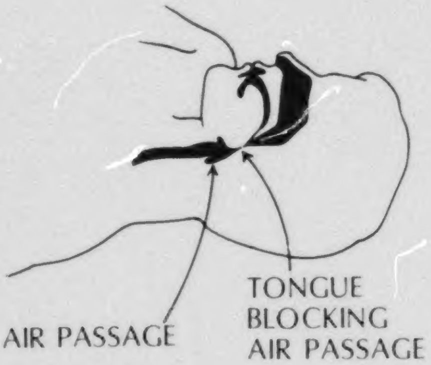

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Figure 2-1.—Blocked Airway.

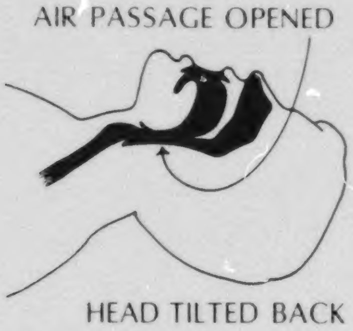

Figure 2-2.—Head Tilt Open Airway.

Place one hand on the victim's forehead and the other under his neck. Apply pressure on the forehead and at the same time lift the neck. Tilting the head in this manner opens the airway. An open airway is shown in figure 2-2.

Jaw Tilt

A second technique for opening the airway is the jaw tilt. This technique is accomplished by kneeling by the top of the victim's head and placing your fingers behind the angles of the lower jaw. Forcefully bring the jaw forward while tilting the head backwards. Separate the lips with your thumbs to allow breathing through the mouth as well as the nose. If no air is exchanged, start artificial ventilation immediately.

NOTE: Use extreme caution when aiding a victim with head, neck or spinal injuries since it is possible to cause further injury and permanent paralysis.

Obstruction in the upper airway (throat) is often caused by attempting to chew food and talk at the same time. One of the most reliable indications of an obstruction is the inability of the victim to speak. Other indicators are the victim grasping or pointing at his throat, exaggerated breathing efforts, and the skin turning cyanotic (bluish color). Your first action upon encountering a victim with this problem is to clear the mouth of any food particles, foreign objects, or loose dentures. If this is not effective, use one of the following procedures.

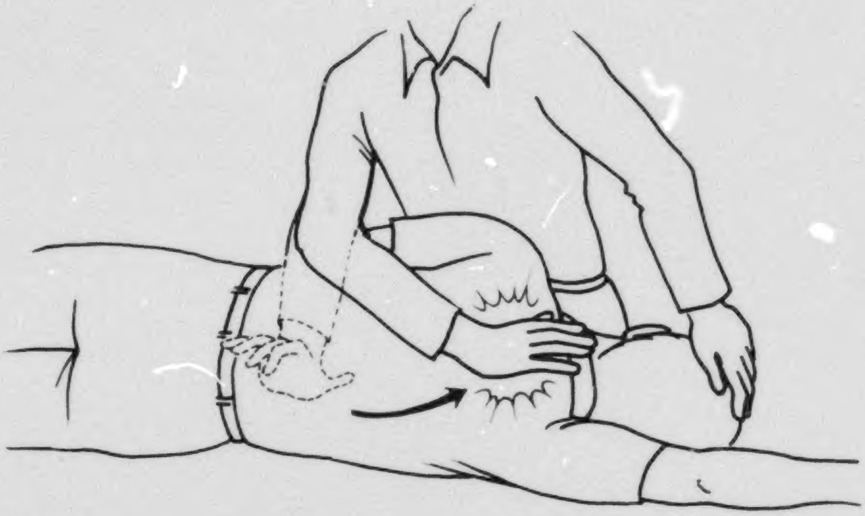

Figure 2-3.—Backslap Technique to Clear Airway.

Backslap

With your open hand, sharply slap the victim on the back between the shoulder blades. Place the other hand on the chest to support the victim. Give sharp blows while the victim attempts to cough up the obstruction, working with the attempts at coughing rather than against. If the victim is lying down, kneel and pull the victim toward you until the victim's chest is resting against your knees. Then administer the open hand slaps as illustrated in figure 2-3.

Abdominal Thrust Standing

Stand behind the victim and wrap your arms around the victim's waist as illustrated in figure 2-4. Grasp your wrist and place the thumb side of your fists against the victim's abdomen, above the navel and just below the rib cage. See figure 2-5. Give a quick upward thrust to the victim. The obstruction should pop out like a champagne cork. If unsuccessful, repeat until the obstruction is dislodged.

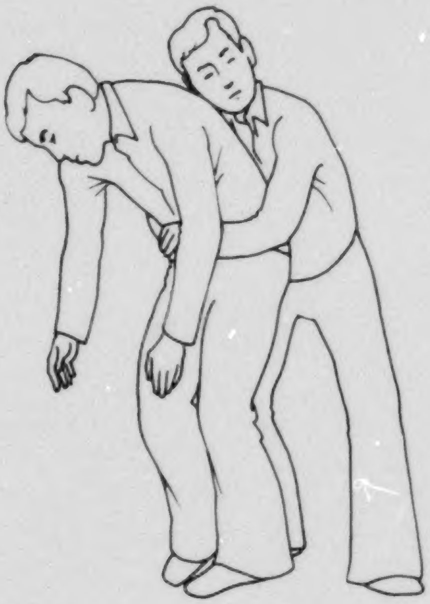

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Figure 2-4.—Position for Standing Abdominal Thrust.

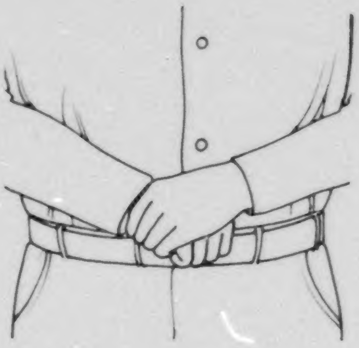

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Figure 2-5.—Correct Hand Positioning.

Abdominal Thrust Reclining

Position yourself for the thrust by either straddling the victim at the hips, straddling one leg, or kneeling at his hips. Place your hands one on top of the other in the area between the lower end of the sternum and the navel, and give a quick upward thrust into the abdomen as illustrated in figure 2-6.

Chest Thrust Standing

Bring your arms under the arms of the victim, and encircle the lower chest as shown in figure 2-7.

Grasp your wrists, keeping the thumb side close to the victim's chest. Keep your fist on the middle, not the lower part of the sternum. Press the chest with a sharp, backward thrust.

Chest Thrust Reclining

Kneel at either side, place one hand on either side of the chest in line with the armpits, and wrap your fingers around each side of the chest. Give a quick downward thrust with the

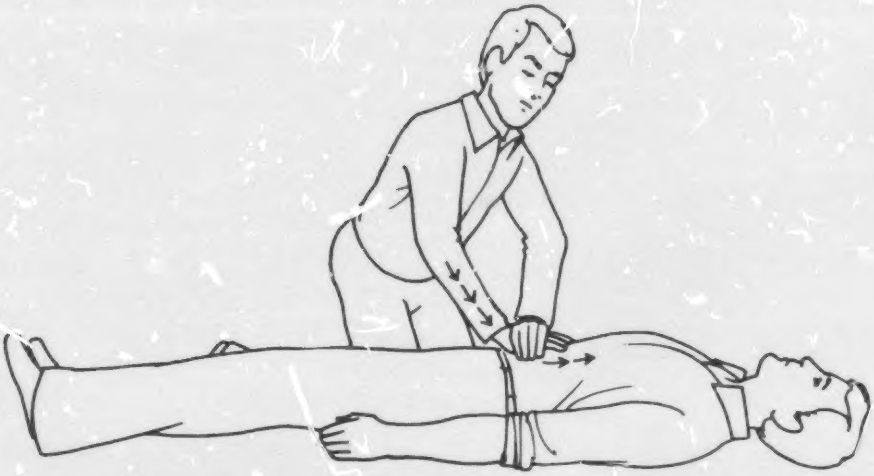

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Figure 2-6.–Position for Reclining Abdominal Thrust.

arms, and an inward thrust, towards the sternum, with the hands. See figure 2-8.

ARTIFICIAL VENTILATION

The purpose of artificial ventilation is to provide a method of air exchange until natural breathing is reestablished. Artificial ventilation should be given only when natural breathing has been suspended; it must NOT be given to any person who is breathing naturally, on his own. Do not assume that a person's breathing has stopped merely because he is unconscious, or because he has been rescued from the water, from poisonous gas, or from contact with an electric wire. Remember: DO NOT GIVE ARTIFICIAL VENTILATION TO A PERSON WHO IS BREATHING NATURALLY. If the victim does not begin spontaneous breathing after using the head or jaw tilt techniques to open the airway, artificial ventilation must be attempted immediately. If ventilation is inadequate, one of the "thrust" methods of clearing the airway must be performed, followed by another attempt of artificial ventilation.

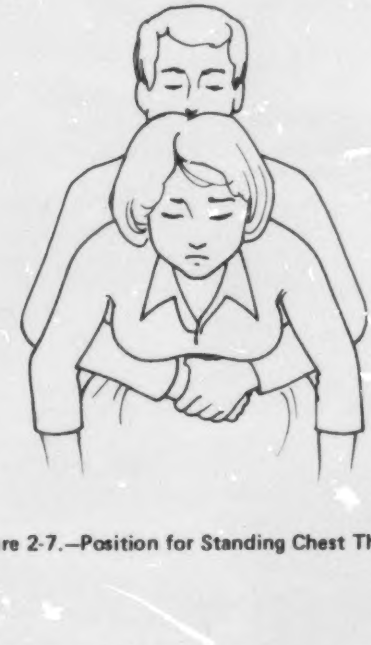

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Figure 2-7.–Position for Standing Chest Thrust.

Mouth To Mouth

To perform mouth to mouth ventilation, place one hand under the victim's neck and the heel of the other on the forehead, using the thumb and index finger to pinch the nostrils shut. Tilt the head back to open the airway.

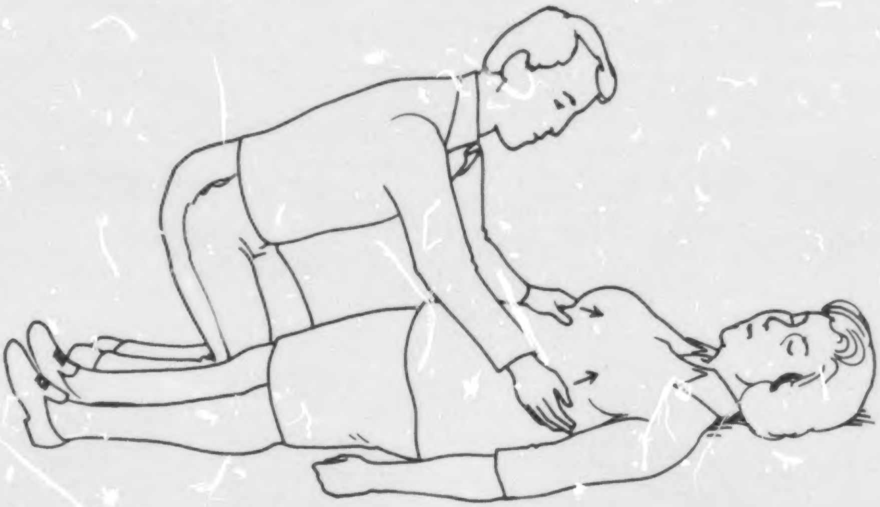

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Figure 2-8.—Position for Reclining Chest Thrust.

Take a deep breath, cover the victim's mouth with your own, and blow into the victim's mouth. Then remove your mouth from the victim's to allow him to exhale. Observe the victim's chest for movement. If he does not breathe on his own, start artificial ventilation with four quick ventilations in succession, allowing the lungs to only partially inflate. If the victim still does not respond, then you must fully inflate his lungs at the rate of 12 VENTILATIONS PER MINUTE, OR ONE BREATH EVERY 5 SECONDS. See figure 2-9 for proper position

Mouth To Nose

Mouth to nose ventilation is effective when the victim has extensive facial or dental injuries or is very young, as it permits an effective air seal.

To administer this method, place the heel of one hand on the victim's forehead and use the other to lift his jaw. After sealing the victim's lips, take a deep breath, place your lips over the victim's nose, and blow. To assist the victim to exhale, you may open his lips. Observe the chest for movement and place your ear next to the victim's nose to listen for, or feel, air exchange. Again, you must continue your efforts at the rate of 12 ventilations per minute, or one breath every 5 seconds until the victim can breathe on his own.

Back Pressure-Arm Lift

Back pressure-arm lift method is an alternate technique used when other methods are not feasible. Place the victim on his stomach, face to one side, neck hyperextended with hands under his head. Quickly clear his mouth of any foreign matter. Kneel at the victim's head and place your hands on his back so that the heels of the hands lie just below a line between the armpits, with thumbs touching and fingers extending downward and outward. Rock forward, keeping your arms straight and exert pressure almost directly downward on the victim's back, forcing air out of his lungs. Then rock backward, releasing the pressure and grasping his arm just above the elbows. Continue to rock backward, pulling his arms upward and inward (toward the

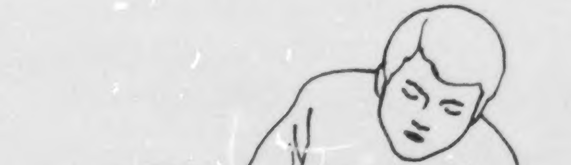

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Figure 2-9.—Mouth to Mouth Ventilation.

head) until resistance and tension in his shoulders are noted. This expands the chest causing active intake of air (inspiration). Rock forward and release the victim's arms. This causes passive exiting of air (expiration). Repeat the cycle of press, release, lift and release 10 to 12 times a minute until the victim can breathe on his own.

GASTRIC DISTENTION

Sometimes during artificial ventilation air enters the stomach instead of the lungs. This condition is called gastric distention. It can be relieved by moderate pressure exerted with a flat hand between the navel and rib cage. Before applying pressure, turn the victim's head to the side so that he does not choke on stomach contents which are often brought up during the process.

CARDIAC ARREST

Cardiac arrest is the complete stoppage of heart function. If the victim is to live, action must be taken immediately to restore heart function.

A rescuer knowing how to administer cardiopulmonary resuscitation (CPR) greatly increases the chances of a victim's survival. CPR consists of external heart compression and artificial ventilation. This compression is performed on the outside of the chest, and the lungs are ventilated either by mouth-to-mouth or mouth-to-nose techniques. To be effective, CPR must be started within 4 minutes of the onset of cardiac arrest. The victim should be laying on a firm surface.

CPR should not be attempted by a rescuer who has not been properly trained. (To learn CPR, consult a hospital corpsman.) Improperly done, CPR can cause serious damage. Therefore, it must never be practiced on a healthy individual for training purposes; use a training aid instead.

One Rescuer Technique

In an unwitnessed cardiac arrest, the rescuer must not assume that an arrest has occurred solely because the victim is lying on the floor and appears to be unconscious. First, try to arouse the victim by gently shaking his shoulders and trying to get him to respond. Quickly check vital signs; if no response, establish an open airway and ventilate the victim four times. Check the carotid (neck) pulse as shown in figure 2-10. If no pulse is felt and there are no visible signs of breathing, start CPR immediately.

To start external cardiac compression, place the victim on his back, establish an open airway, and kneel at right angles to the victim's body. You have a choice of two methods to locate the sternum (breastbone).

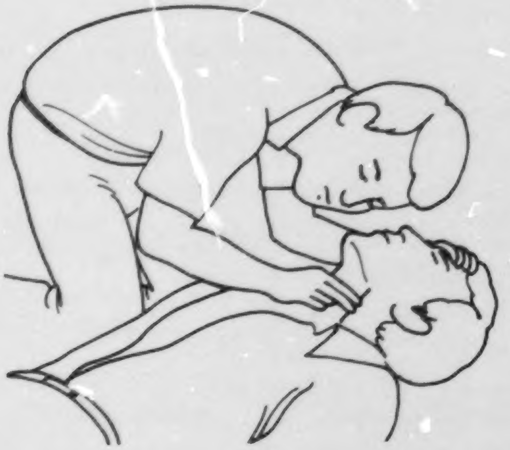

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Figure 2-10.—Feeling for the Carotid Pulse.

One is to bare the chest and locate the sternum by drawing an imaginary line from one nipple to the other to identify the proper area of the sternum which is darkened in figure 2-11.

The other is to locate the lower tip of the sternum with the index and middle fingers, placing the heels of your hands above your fingers in the darkened area.

There is a small piece of cartilage at the lower end of the sternum (fig. 2-11). A fracture of this area can damage the liver, causing hemorrhage (bleeding heavily), and death. When you place the heels of your hands on the victim's chest, stay above the tip of the sternum.

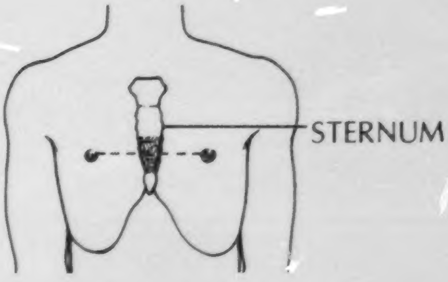

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Figure 2-11.—Locating the Sternum.

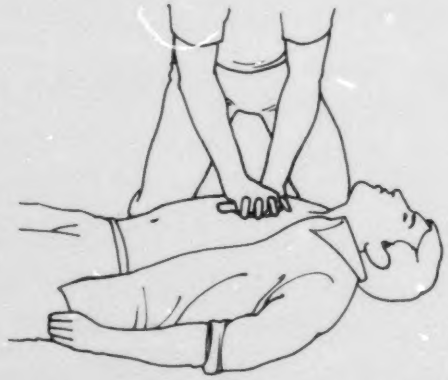

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Figure 2-12.—Position for Cardiac Compression.

Place the heel of one hand directly on the sternum, and the heel of the other on top of the first. See figure 2-12. Interlock your fingers and KEEP THEM OFF THE VICTIM'S CHEST!

Lean or rock forward with elbows locked, and apply vertical pressure to depress the sternum (adult) 1-1/2 to 2 inches. Then release the pressure, keeping the hands in place. Administer 60 to 80 compressions per minute.

You will feel less fatigue as you use proper technique, and a more effective compression will result. Ineffective compression occurs when the elbows are not locked, the rescuer is not directly over the sternum, or the hands are improperly placed on the sternum.

When one rescuer performs CPR, as shown in figure 2-13, the ratio of compressions to ventilations is 15 to 2. After 15 compressions, you must give the victim 2 ventilations. This ratio must continue for 4 full cycles. Check for pulse, and breathing. If there are still no signs of recovery, continue CPR until the victim can breathe unassisted or you are relieved by medical personnel.

Before learning the next technique, review the steps to take in an unwitnessed cardiac arrest involving one rescuer.

1. Determine whether victim is conscious
2. Check vital signs

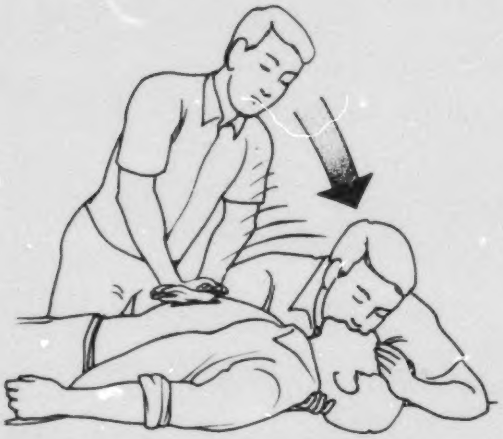

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Figure 2-13.–One Rescuer CPR Technique.

3. Ventilate 4 times (it may be necessary to remove an airway obstruction at this time!)

4. Again check vital signs; if none:

5. Begin compression-ventilation rate of 15 to 2, four complete cycles

6. Check pulse, breathing, pupils; if no change:
7. Continue compression-ventilation rate of 15 to 2 until victim is responsive, or you are relieved by medical personnel.

Two Rescuer Technique

If two people trained in CPR are on the scene, one must perform compressions while the other performs ventilations. The ratio for two-person CPR is 5 compressions to 1 ventilation. One rescuer is positioned at the chest area and the other beside the victim's head. The rescuers should be on opposite sides of the victim.

To help avoid confusion, one rescuer must be designated the leader. The leader must make the preliminary checks of the victim's vital signs and perform the initial four ventilations. The second rescuer will perform the compressions and get the victim and himself ready for compression.

When CPR is started, the compressions should be given in a constant, methodical rhythm. The rescuer giving the compressions counts them out loud. As the fifth compression is released, the other rescuer ventilates the victim. Do not stop the compressions while ventilation is being given.

CHAPTER 3

HEMORRHAGE

Blood is circulated throughout the body by means of three different kinds of blood vessels: arteries, veins and capillaries. ARTERIES are large vessels which carry the blood away from the heart; VEINS are large vessels which carry the blood back to the heart; and CAPILLARIES form a connecting network of smaller vessels between the arteries and the veins.

Hemorrhage (escape of blood) occurs whenever there is a break in the wall of one or more blood vessels. In most small cuts, only capillaries are injured. Deeper wounds result in injury to veins or arteries. Bleeding which is severe enough to endanger life seldom occurs except when arteries or veins are cut.

The average adult body contains about 5 quarts (5 liters) of blood. One pint of blood can usually be lost without harmful effect–in fact, this is the amount usually given by blood donors. However, the loss of 2 pints (1 liter) will usually cause shock, and shock becomes greater and greater as the amount of blood loss increases. If half the blood in the body is lost death almost always results.

Capillary blood is usually brick red in color. If capillaries are cut, the blood oozes out slowly. Blood from the veins is dark red. If a vein is cut, the blood escapes in a steady, even flow. If an artery near the surface is cut, the blood will gush out in spurts which are synchronized with the heart beats; but if the cut artery is deeply buried, the bleeding will appear to be a steady stream. Arterial blood is usually bright red in color.

In actual practice, you might find it difficult to decide whether bleeding was venous or arterial, but the distinction is not usually important. A person can bleed to death quickly from a cut artery; prolonged bleeding from any large cut can, of course, have the same effect. The important thing to know is that ALL bleeding must be controlled as quickly as possible.

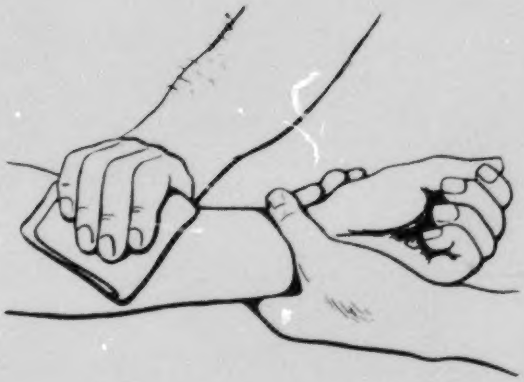
CONTROL OF HEMORRHAGE

The only way to stop serious bleeding is by the application of pressure. In practically all cases, bleeding can be stopped if pressure is applied DIRECTLY TO THE WOUND. If direct pressure does not stop the bleeding, pressure should be applied at the appropriate PRESSURE POINT. In those very rare cases where bleeding is so severe that it cannot be controlled by either of these methods, pressure can be applied by means of a tight constricting band called a TOURNIQUET. These three ways of using pressure to control hemorrhage are described below.

Direct Pressure

In almost every case, bleeding can be stopped by the application of pressure directly on the wound. Place a dressing (sterile or clean if possible) over the wound and firmly fasten it in position with a bandage. If bleeding does not stop, firmly secure another dressing over the first, or apply direct pressure with your hand to the dressing (fig. 3-1).

In cases of severe hemorrhage, do not worry too much about the dangers of infection. The basic problem is to stop the flow of blood. If no



136.2

Figure 3-1.—Direct Pressure.

material is available, simply thrust your hand onto the wound. Remember, DIRECT PRESSURE is the first method to use when you are trying to control hemorrhage.

Pressure Points

Bleeding from a cut artery or vein may often be controlled by applying pressure to the appropriate pressure point. A PRESSURE POINT is a place where the main artery to the injured part lies near the skin surface and over a bone. Pressure at such a point is applied with the fingers (digital pressure) or with the hand; no first aid materials are required. The object of the pressure is to compress the artery against the bone, thus shutting off the flow of blood from the heart to the wound.

There are 11 principal points on each side of the body where hand or finger pressure can be used to stop hemorrhage. These points are shown in figure 3-2. Notice that arteries are shown in red and veins are shown in blue.

If bleeding occurs on the face below the level of the eyes, pressure should be applied to the point on the lower jawbone. This is shown in figure 3-2A. To find this pressure point, start at the angle of the jaw and run your finger forward along the lower edge of the jawbone until you feel a small notch. The pressure point is in this notch.

If bleeding is in the shoulder or in the upper part of the arm, apply pressure with the fingers in back of the collarbone. You can press down against the first rib or forward against the collarbone—either kind of pressure will stop the bleeding. This pressure point is shown in figure 3-2B.

Bleeding between the middle of the upper arm and the elbow should be controlled by applying digital pressure on the inner (body) side of the arm, about halfway between the shoulder and the elbow. This compresses the artery against the bone of the arm. The application of pressure at this point is shown in figure 3-2C.

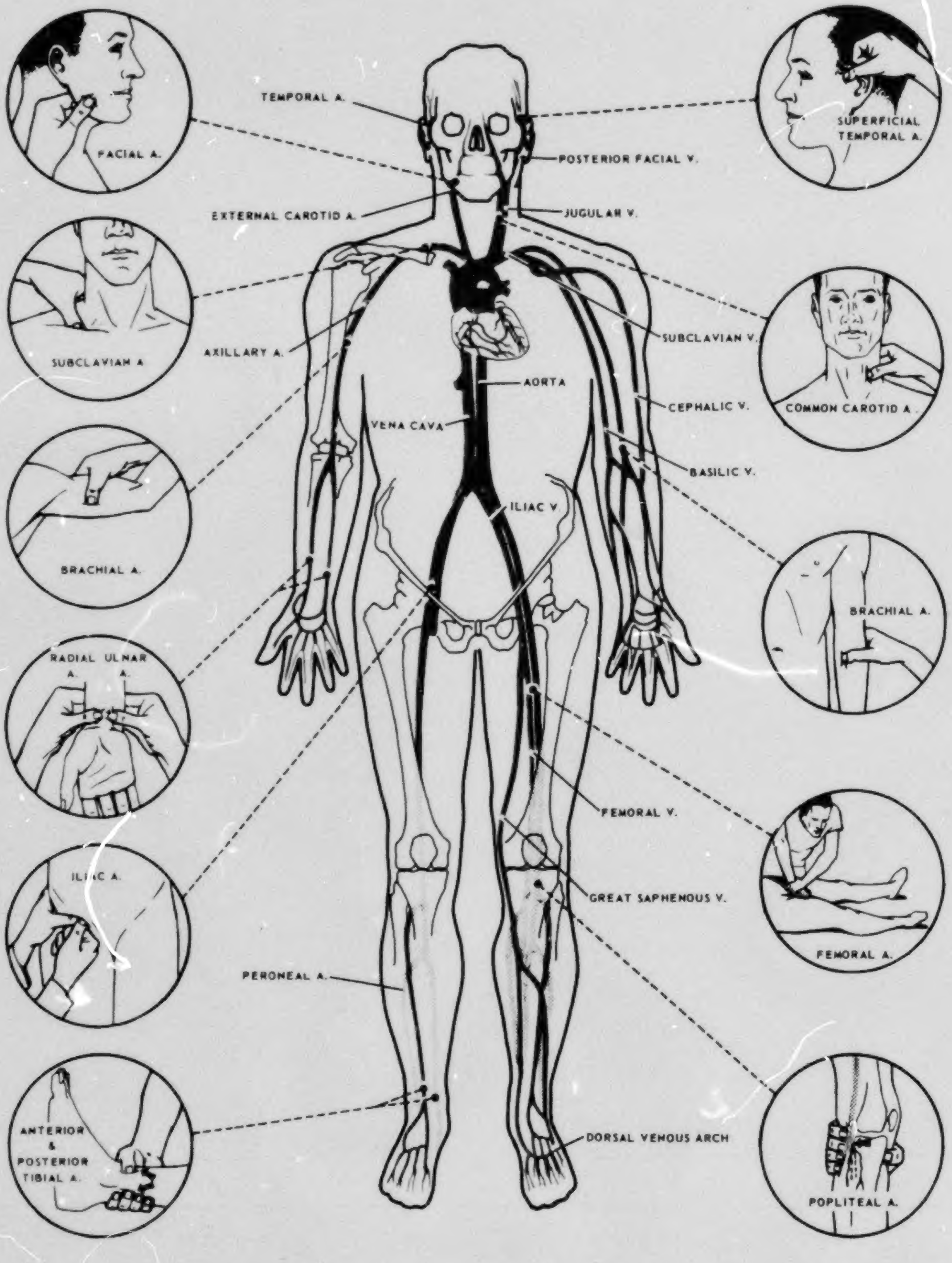
Bleeding from the hand can be controlled by pressure at the wrist, as shown in figure 3-2D. If it is possible to hold the arm up in the air, the bleeding will be relatively easy to stop.

Figure 3-2E shows how to apply digital pressure in the middle of the groin, so as to control bleeding from the thigh. The artery at this point lies over a bone and quite close to the surface, so pressure with your fingers may be sufficient to stop the bleeding.

Figure 3-2F shows the proper position for controlling bleeding from the foot. As in the case of bleeding from the hand, elevation is very helpful in controlling this bleeding.

If bleeding is in the region of the temple or the scalp, use your finger to compress the main artery to the temple against the skull bone, at the pressure point just in front of the ear. Figure 3-2G shows the proper position.

If the neck is bleeding, apply pressure below the wound, just in front of the prominent neck muscle. Press inward and slightly backward, compressing the main artery of that side of the neck against the bones of the spinal column. The


TEMPORAL A.
SUPERFICIAL TEMPORAL A.
FACIAL A.
POSTERIOR FACIAL V.
EXTERNAL CAROTID A.
JUGULAR V.
SUBCLAVIAN A.
AXILLARY A.
SUBCLAVIAN V.
COMMON CAROTID A.
AORTA
VENA CAVA
CEPHALIC V.
BASILIC V.
BRACHIAL A.
ILIAC V.
BRACHIAL A.
RADIAL A.
ULNAR A.
FEMORAL V.
FEMORAL A.
ILIAC A.
GREAT SAPHENOUS V.
PERONEAL A.
ANTERIOR & POSTERIOR TIBIAL A.
DORSAL VENOUS ARCH
POPLITEAL A.

136.3

Figure 3-2.—Pressure Points for Control of Bleeding.

application of pressure at this point is shown in figure 3-2H.

Do not apply pressure at this point unless it is absolutely essential, since there is great danger of pressing on the windpipe and thus choking the victim.

Bleeding from the lower arm (forearm) can be controlled by applying pressure at the elbow, as shown in figure 3-2I.

As mentioned before, bleeding in the upper part of the thigh can sometimes be controlled by applying digital pressure in the middle of the groin, as shown in figure 3-2E. Sometimes, however, it is more effective to use the pressure point in the upper thigh, as shown in figure 3-2J. If you use this point, apply pressure with the closed fist of one hand and use the other hand to give additional pressure. The artery at this point is deeply buried in some of the heaviest muscle of the body, so a great deal of pressure must be exerted in order to compress the artery against the bone.

Bleeding between the knee and the foot may be controlled by firm pressure at the knee. If pressure at the side of the knee does not stop the bleeding, hold the front of the knee firmly with one hand and thrust your fist hard against the artery behind the knee, as shown in figure 3-2K. If necessary, you can place a folded compress or bandage behind the knee, bend the leg back, and hold it in place by a firm bandage. This is a most effective way of controlling bleeding, but it is so uncomfortable for the victim that it should be used only as a last resort.

You should memorize these pressure points so that you will know immediately which point to use for controlling hemorrhage from a particular part of the body. In the discussion of these pressure points, did you notice the general principle by which you can determine the proper point to use? The correct pressure point is that which is (1) NEAREST THE WOUND, and (2) BETWEEN THE WOUND AND THE MAIN PART OF THE BODY.

It is very tiring to apply digital pressure, and it can seldom be maintained for more than 15 minutes. Pressure points are recommended for use while direct pressure is being applied to a serious wound. If bleeding continues to be severe even after direct pressure and pressure points have been used, you may have to apply a tourniquet.

Use of the Tourniquet

A tourniquet is a constricting band which is used to cut off the supply of blood to an injured limb. It cannot be used to control bleeding from the head, neck, or body, since its use in these positions would result in greater injury or death. A tourniquet should be used only if the control of hemorrhage by other means proves to be difficult or impossible.

Basically, a tourniquet consists of a pad, a band, and a device for tightening the band so that the blood vessels will be compressed. There are several different kinds of readymade tourniquets. A variety of materials can be used to improvise tourniquets. Any round, smooth pressure object may be used–a compress, a roller bandage, a stone, a rifle shell–and any long, flat material may be used as the band. It is important that the band be flat: belts, stockings, flat strips of rubber, or neckerchiefs can be used; but rope, wire, string, or very narrow pieces of cloth should not be used because they will cut into the flesh. A short stick may be used to twist the band, thus tightening the tourniquet.

A tourniquet must always be applied ABOVE the wound–that is, towards the body–and it must be applied as close to the wound as practicable.

It is best to use a pad, compress, or similar pressure object, if one is available. It goes under the band. It must be placed directly over the artery, or it will actually decrease the pressure on the artery and thus allow greater flow of blood. If a tourniquet placed over a pressure object does not stop the bleeding, there is a good chance that the pressure object is in the wrong place. If this occurs, shift the object around until the tourniquet, when tightened, will control the bleeding. If no suitable pressure object is available, use the tourniquet without it.

To apply an emergency tourniquet made from something like a neckerchief, wrap the material once around the limb and tie an overhand knot, place a short stick on the overhand knot and tie a square knot over it.

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Then twist the stick rapidly to tighten the tourniquet. The stick may be tied in place with another strip of material. Figure 3-3 shows how to apply a tourniquet.

In order to be effective, a tourniquet must be tight enough to stop the arterial blood flow to the limb. If the pressure from the tourniquet is less than the arterial pressure, arterial bleeding will continue. Also, insufficient tourniquet pressure may actually increase the amount of bleeding from the veins. So be sure to draw the tourniquet tight enough to stop the bleeding. However, do not make it any tighter than necessary.

You must remember that a tourniquet is NEVER put on unless the hemorrhage is so severe that it cannot be controlled in any other way; by the time the tourniquet is put on, therefore, the victim has already lost a considerable amount of blood. Once a tourniquet has been applied, it should be released only by medical personnel.

After you have brought the bleeding under control with the tourniquet, apply a sterile compress or dressing to the wound, and fasten it in position with a bandage.

Here are the points to remember about using a tourniquet:

1. Don't use a tourniquet unless you can't control the bleeding by any other means.

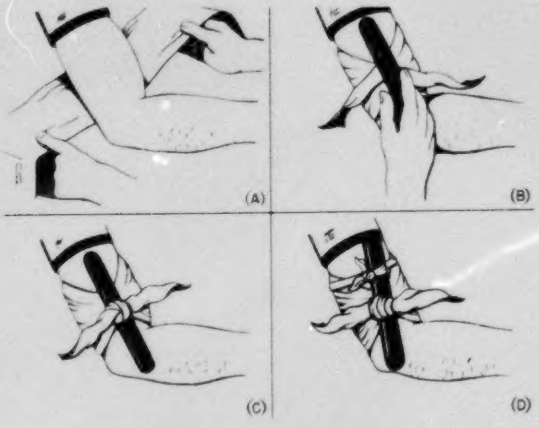

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Figure 3-3.—Applying a Tourniquet.

2. Don't use a tourniquet for bleeding from head, face, neck, or body. Use it only on the limbs.

3. Always apply a tourniquet ABOVE THE WOUND, and as close to the wound as possible.

4. Be sure you draw the tourniquet tight enough to stop the bleeding, but don't make it any tighter than necessary.

5. Don't loosen a tourniquet after it has been applied, except in extreme emergency.

6. Don't cover a tourniquet with a dressing. If it is necessary to cover the injured person in some way, MAKE SURE that all other people concerned with the case know about the tourniquet. Using crayon, skin pencil, or blood, mark a large "T" on the victim's forehead or on a medical tag attached to his wrist.

EMERGENCY SITUATIONS

Bleeding from most external wounds is fairly easy to control. When some of the larger arteries are cut, however, hemorrhage may be so rapid that death will result within a few minutes. Possible methods of controlling the flow of blood in some of these emergency situations are briefly described below.

Wounds of the neck are often caused by sharp objects such as knives, razors, and glass fragments. Sometimes, the large artery is cut, sometimes the large vein, and sometimes both; in any event, the blood loss will be extremely rapid. It is sometimes possible to control the bleeding from these wounds by applying hand pressure above AND below the cut; such pressure must be maintained until a medical officer gives further instructions. It is a good idea to use cloth under your hands, if any is available, because the blood makes the neck very slippery and difficult to hold.

If the large artery in the leg is cut, the bleeding is very rapid. At least partial (and perhaps complete) control of the hemorrhage can be and should be attained by immediately applying extreme pressure directly over the wound. Cover your clenched fist with any clothing or other cloth which is available, and thrust your fist directly onto the wound. (If no cloth is available, use your fist alone; but you will find it more difficult to control the bleeding in this way because your fist and the wound will both become very slippery.) If a tourniquet becomes necessary continue to apply direct pressure with your hand while it is being applied.

Internal bleeding may be caused by deep wounds or by heavy blows which rupture internal blood vessels. The actual control of internal bleeding is beyond the scope of first aid, but the victim should always be treated for shock. (See Ch. 4.)

GENERAL FIRST AID MEASURES

In addition to knowing how to control serious bleeding by the application of pressure, you must know the following measures which are important in the first aid treatment of a person who has suffered severe bleeding. Any person who has lost a large amount of blood must be treated by medical personnel as soon as possible. In the meantime, however, you can greatly improve his chances for recovery by treating him for shock as soon as possible, and by keeping him quiet.

Shock is always present in persons who have lost a large amount of blood. If you don't see any symptoms of shock, treat the person for it anyway; since the measures used to prevent shock are the same as those used to treat it, you may prevent its occurrence or, at least, lessen its severity.

Keep the casualty quiet. Try to keep him from getting excited. Do not move him unnecessarily, and do not handle him roughly. Keeping him quiet will allow a clot to form in the wound, and will also help to prevent the occurrence of shock. In some cases raising the injured part may help stop the bleeding–but don't try to do this if there is any other injury, such as a fracture or a dislocation, which would be made worse by such treatment. Try in every way to be careful and gentle in handling the casualty, and do everything you can to make him as comfortable as possible under the circumstances.

CHAPTER 4

SHOCK

When you hit the end of your finger with a hammer, you get a response from your whole body. Since your finger hurts, you might think that it is the only part of you which is responding to the injury; but actually a great many changes are taking place in your body while you are concerned with the immediate pain. Your body AS A WHOLE is injured, and your body AS A WHOLE attempts to recover from the injury. A series of changes takes place, designed to restore the body to its normal, healthy condition.

Sometimes, however, the changes which occur may in themselves cause further damage to the body. To some extent this is what happens in shock. When a person is injured, the blood flow in his entire body is disturbed. To overcome this difficulty, the heart beats faster and the blood vessels near the skin and in the arms and legs constrict, thus sending most of the available blood supply to the vital organs of the body and to the nerve centers in the brain which control all vital functions.

While this is going on, the other body cells do not receive enough blood and therefore do not get enough oxygen or food. The blood vessels, like the rest of the body, suffer from this lack, and eventually they lose their ability to constrict. When this happens, the vital organs and the brain do not receive enough blood, and the condition of shock becomes worse and worse. If this situation continues, the damage presently becomes so extensive that recovery is impossible. In less severe cases, prompt first aid treatment for shock may make the difference between life and death. In mild cases of shock, recovery usually occurs naturally and rather quickly.

Basically, then, shock is a condition in which the circulation of the blood is seriously disturbed. As we will see later, the measures used to combat shock are aimed at helping the body to recover from this disturbance of the blood flow.

CAUSES OF SHOCK

Serious shock occurs as a result of serious injury to any part of the body. Crush injuries, fractures, burns, poisoning, and prolonged bleeding are very likely to cause serious shock. An interruption of breathing, from whatever cause, is almost always followed by severe shock. Blast and concussion injuries, caused by pressure waves resulting from the detonation of high explosives in the air or under water, may severely damage the internal organs of the body and cause extensive shock. (As a matter of fact, signs of shock are sometimes the only outward indication of blast or concussion injury.) In short, any damage to the body is accompanied by or followed by some degree of shock.

There are a number of factors which affect the seriousness of shock. Age, for example, is often a determining factor. Very young children and very old people do not usually have as much resistance to shock as young or middle-aged adults. Pain can produce shock, or increase its severity. People who have been starved, deprived of water, or exposed to extremes of cold or heat go into shock very easily. Excessive fatigue can increase the severity of shock. As a general rule, people who have any kind of chronic sickness are likely to go into shock more easily than healthy people. In addition to these factors, there are some unexplained differences between individuals in regard to their resistance to shock—an injury which might cause mild shock in one person could cause serious, perhaps fatal, shock in another.

As you can see, it is not possible to list all the causes of shock. Just remember that shock is sure to accompany or follow any serious injury, and that it is often the most serious consequence of the injury.

HOW TO RECOGNIZE SHOCK

A person who is going into shock may show quite a few signs or symptoms. Some of these are indicated in figure 4-1 and are discussed below. Remember, however, that signs of shock do not always appear at the time of the injury, indeed, in many very serious cases they may not appear until hours later.

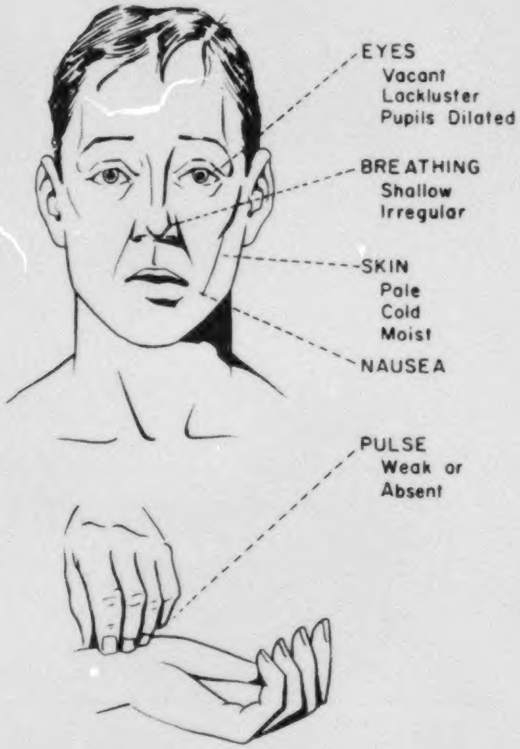

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Figure 4-1.—Symptoms of Shock.

The symptoms shown by a person suffering from shock are, directly or indirectly, due to the fact that the circulation of the blood is disturbed. The pulse is weak and rapid. Breathing is likely to be shallow, rapid, and irregular, because the poor circulation of the blood affects the breathing center in the brain. The temperature near the surface of the body is lowered because of the poor blood flow; so the face, arms, and legs feel cold to the touch. Sweating is likely to be very noticeable. A person in shock is usually very pale, but in some cases there may be a bluish or reddish color to the skin. The pupils of the eyes are usually dilated (enlarged).

If the man is conscious, he may complain of thirst. He may have a feeling of weakness, faintness, or dizziness. He may feel nauseated. Also, he may be very restless and feel frightened and anxious. As shock deepens, these signs gradually disappear and he becomes less and less responsive to what is going on around him. Even pain may not arouse him. Finally, he may become unconscious.

It is not likely that you will see all these symptoms of shock in any one case. Some of them appear only in late stages of shock, when the disturbance of the blood flow has become so great that the man's life is in serious danger. Sometimes the signs of shock may be disguised by other signs of injury. It is important to know what symptoms indicate the presence of shock, but don't ever wait for symptoms to develop before beginning the treatment for shock. Remember, EVERY SERIOUSLY INJURED PERSON IS LIKELY TO DEVELOP SERIOUS SHOCK.

PREVENTION AND TREATMENT OF SHOCK

In many emergency situations, the most helpful thing you can do for an injured person is to begin treatment for shock. If shock has not yet developed, the treatment may actually prevent its occurrence: if it has developed, you may be able to keep it from reaching a critical point. As we have seen, shock creates a vicious circle—the worse it is, the worse it gets. It is extremely important, that you begin the treatment at the first possible moment.

In order to give first aid treatment to a person in shock, you will need to know how warm he should be kept, what position is best for him, and what you may do to relieve pain.

A person in shock is often thirsty. No particular harm will be done if you allow the victim to moisten his mouth and lips with cool water, if it will make him more comfortable; but in general there is no need to give him anything to drink unless you are in a position where medical personnel will not be available for an excessively long period of time.

If medical care will not be available you should give SMALL AMOUNTS of warm water, preferably mixed with 1 teaspoon of salt and 1/2 teaspoon of baking soda per quart or liter, if he is conscious and able to swallow and if he has not suffered internal injuries.

In the case of burns, an exception must be made to the rule of not giving liquids. A seriously burned person has an overwhelming need for fluids. It is therefore a permissible and even desirable part of first aid treatment for burns to give water or other liquids. Sweet tea, fruit juices, or sugar water may be given, if the casualty is conscious and able to swallow, if he has no internal injuries, and if vomiting is no problem.

One final precaution must be given concerning the use of liquids: NEVER GIVE ALCOHOL TO A PERSON IN SHOCK OR WHO MAY GO INTO SHOCK. Alcohol increases the blood supply to surface vessels and so diminishes the blood supply to the brain and other vital organs.

HEAT

Heat is important in the treatment of shock to the extent that the injured person's body heat must be conserved. Exposure to cold, with resulting loss of body heat, can cause shock to develop or to become worse. You will have to judge the amount of covering to use by considering the weather and the general circumstances of the accident. Often a light covering will be enough to keep the casualty comfortable. Wet clothing should be removed and dry covering provided, even on a hot day. Use blankets or any dry material to conserve body heat. Artificial means of warming (hot water bottles, heated bricks, heated sand) should not ordinarily be used. Artificial heat may cause loss of body fluids (by sweating) and it brings the blood closer to the surface, thus defeating the body's own efforts to supply blood to the vital organs and to the brain. Also, the warming agent may burn the victim.

KEEP AN INJURED PERSON WARM ENOUGH FOR COMFORT, BUT DO NOT OVERHEAT HIM.

POSITION

The best position to use for the prevention or treatment of shock is one which encourages the flow of blood to the brain. If it is possible to place the injured person on his back on a bed, cot, or stretcher, you can raise the lower end of the support about 12 inches so that his feet will be higher than his head (fig. 4-2). If the circumstances of the accident make it impossible to do this, it might still be possible for you to raise his feet and legs enough to help the blood flow to the brain. Sometimes it is possible to take advantage of a natural slope of ground and place the casualty so that his head is lower than his feet.

In every case, of course, you will have to consider what type of injury is present before you can decide on the best position. For example, a person with a chest wound may have so much trouble breathing that you will have to

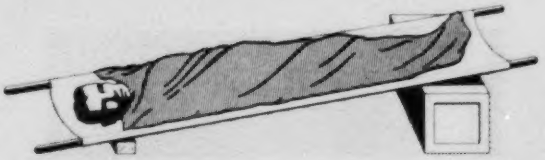

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Figure 4-2.—Position for Treatment of Shock.

raise his head slightly. If the face is flushed rather than pale, or if you have any reason to suspect a head injury, do not raise the feet; instead, you should keep the head level with, or slightly higher than the feet. If the person has broken bones, you will have to judge what position would be best both for the fractures and for shock. A fractured spine must be immobilized before the victim is moved at all, if further injuries are to be avoided. If you have any doubts about the correct position to use, have the victim lie flat on his back. THE BASIC POSITION FOR TREATING SHOCK IS ONE IN WHICH THE HEAD IS LOWER THAN THE FEET. Do the best you can, under the particular circumstances, to get the injured person into this position. In any case, never let a seriously injured person sit, stand or walk around.

RELIEF OF PAIN

A long accepted, but false generalization is that all extensive injuries are associated with severe pain and that the more extensive the injury, the worse the pain. In reality, severe and even fatal injuries may be considerably less painful than a mashed fingertip, which can cause agony.

Another generalization is that, with similar injuries, everyone experiences the same amount of pain. This, too, is incorrect. Some feel pain far more severely than others. Also, those who would not be in much pain from a wound when rested, relaxed, and confident might experience severe pain from the same wound if exhausted, tense, and fearful. Persons in shock tend to feel less pain. However, pain, unless relieved, may cause or increase shock.

Relief of pain can often be accomplished without the use of drugs. The injured man should be assured and made to realize that his injuries are understood and that he will get the best possible care. He should also be told of plans to get medical help or plans to move him to a place where medical assistance is available.

SUPPORT FOR AN INJURY.–Pain can often be relieved by furnishing adequate support for an injury. Fractures of bones in which the surrounding tissue swells rapidly are extremely painful when left unsupported. Adequate immobilization of fractures not only relieves pain but prevents further tissue damage and shock. Needless suffering can often be eliminated by unlacing or slitting a shoe or loosening tight clothing in the region of the injury. Often a simple adjustment of a bandage or splint will be of much benefit, especially when accompanied by a few encouraging words.

CHAPTER 5

WOUNDS

Any injury which causes a break in the skin, underlying tissue or other body membranes is known as a WOUND. The two main dangers involved in this type of injury are SERIOUS BLEEDING and INFECTION. Serious bleeding has been discussed in chapter 3. In this chapter we will take up the classification of wounds, the general treatment of fresh wounds, special problems which arise because of the location of the wounds, the general problem of infection, and the use of dressings and bandages in the first aid treatment of wounds.

CLASSIFICATION OF WOUNDS

Wounds may be classified according to their general condition, size, location, the manner in which the skin or tissue is broken, and the agent which caused the wound. It is usually necessary for you to consider some or all of these factors in order to determine what first aid treatment is appropriate for a wound.

General Condition of the Wound

If the wound is fresh, first aid treatment consists mainly of stopping the flow of blood, treating for shock, and preventing infection. If the wound is already infected, first aid consists of keeping the victim quiet, elevating the injured part, and applying warm wet dressing. If the wound contains foreign objects, first aid treatment may include removing them if they are not too deeply embedded.

Size of the Wound

In general, large wounds are more serious than small ones because they usually involve more severe bleeding, more damage to the underlying organs or tissues, and a greater degree of shock. However, small wounds are sometimes more dangerous than large ones because they may become infected more easily.

Location of the Wound

Since a wound may involve serious damage to deeper structures, as well as to the skin and the tissues immediately below it, the location of the wound is an important consideration. For example: A knife wound in the chest is likely to puncture a lung and cause serious interference with breathing. The same type of wound in the abdomen might cause a dangerous infection in the abdominal cavity, or it might actually puncture the intestines, the liver, the kidneys, or other vital organs. A knife wound to the head might cause brain damage. And the same kind of a wound in a less vital spot (as perhaps, an arm or a leg) might be relatively unimportant.

How the Skin is Broken

When considered from the point of view of the manner in which the skin or tissue is broken, there are four general kinds of wounds: Abrasions, incisions, lacerations, and punctures. Many wounds, of course, are combinations of two or more of these basic types.

ABRASIONS.–Abrasions are made when the skin is rubbed or scraped off. "Rope burns," "floor burns," and "skinned" knees or elbows are common examples of abrasions. This kind of wound can become infected quite easily, because dirt and germs are usually ground into the tissues.

INCISIONS.–Incisions, commonly called CUTS, are wounds made by sharp cutting instruments such as knives, razors, broken glass, etc. Incisions tend to bleed very freely because the blood vessels are cut straight across. There is relatively little damage to the surrounding tissues. Of all classes of wounds, incisions are least likely to become infected, since the free flow of blood washes out many of the micro-organisms (germs) which cause infection.

LACERATIONS.–Lacerations are wounds which are torn, rather than cut. They have ragged, irregular edges, and masses of torn tissue underneath. These wounds are usually made by blunt, rather than sharp, objects. A wound made by a DULL knife, for instance, is more likely to be a laceration than an incision. Bomb fragments often cause lacerations. Many of the wounds caused by accidents with machinery are lacerations, they are often complicated by crushing of the tissues as well. Lacerations are frequently contaminated with dirt, grease, or other material which is ground into the tissues; they are therefore very likely to become infected.

PUNCTURES.–Punctures are caused by objects which penetrate some distance into the tissues while leaving a relatively small surface opening. Wounds made by nails, needles, wire, knives, and bullets are usually punctures. As a rule, small puncture wounds do not bleed freely; however, large puncture wounds may cause severe internal bleeding. The possibility of infection is great in all puncture wounds especially if the penetrating object has tetanus germs on it. Tetanus is the organism which causes "lockjaw".

Causes of the Wound

Although it is not always necessary to know what agent or object has caused a wound, it is frequently helpful. Knowing what has caused the wound may give you some idea of the probable size of the wound, its general nature, the extent to which it is likely to be contaminated with foreign matter, and what special dangers must be guarded against.

TREATMENT OF FRESH WOUNDS

As we have seen, there are several ways of classifying wounds, and there are various special problems which must be considered in treating different kinds of wounds. However, there are three basic rules to be followed in the treatment of practically all fresh wounds: Stop the flow of blood, treat the victim for shock, and do whatever you can to prevent infection. In addition, it is sometimes necessary to remove foreign objects from a wound, and it is sometimes necessary to immobilize the injured part in order to prevent further damage.

Stopping the Flow of Blood

The first aid methods which are used to stop serious bleeding (described in chapter 3) depend upon the application of pressure. Pressure may be applied in three ways: (1) Directly to the wound; (2) at key pressure points throughout the body; and (3) by means of a tourniquet. You will recall that DIRECT PRESSURE should be tried first, and the other two methods should be used ONLY if direct pressure fails to stop the flow of blood. For almost all minor wounds, a combination of direct pressure and elevation of the wounded part will be sufficient to stop the bleeding.

In general, the term DRESSING is used to describe everything which is used to cover or dress a wound. The sterile pad which is put directly over the wound is called a COMPRESS. A BANDAGE is used to hold the compress in position.

Dressings

A combined compress and bandage, in which the sterile gauze pad is fastened to a gauze, muslin, or adhesive bandage, is usually referred to as a dressing. Most Navy first aid kits contain both large and small dressings of this kind.

Any part of a dressing which is to come in direct contact with a wound should be absolutely sterile—that is, it should be free from micro-organisms (germs). The dressings which you will find in first aid kits have been sterilized. However, if you touch them with your fingers, your clothes, or any other unsterile object, they are of course no longer sterile. If you drag a dressing across the victim's skin, or allow it to slip after it is in place, the dressing is no longer sterile.

Compresses

Emergencies sometimes arise in which it is impossible to obtain a regular sterile compress. In such a situation, use the cleanest cloth available. A freshly laundered handkerchief, towel, shirt, etc., may be used; unfold it carefully so that you will not touch the part which goes next to the wound.

A compress should be large enough to cover the entire area of the wound, and to extend at least 1 inch in every direction beyond the edges. If the compress is not large enough, the edges of the wound are almost sure to become contaminated.

Materials which are likely to stick to a wound or which may be difficult to remove should NEVER be used directly over a wound. Absorbent cotten, collodion, impregnated cloth, adhesive tape, electrician's tape, and friction tape are examples of materials which should not come in direct contact with a wound.

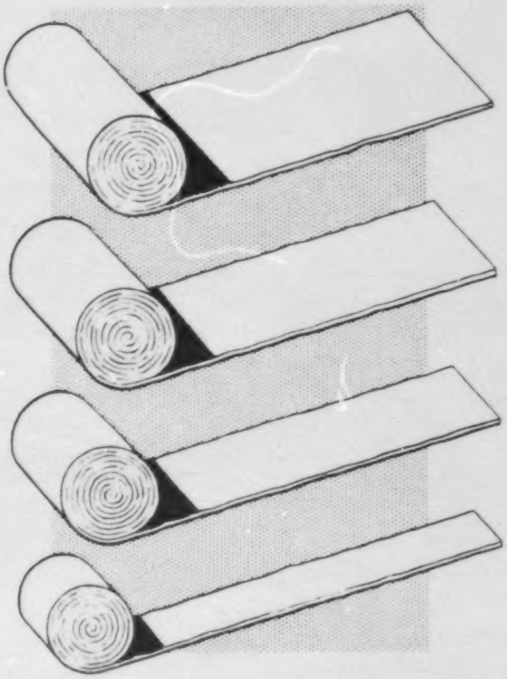

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Figure 5-1.—Roller Bandages.

Bandages

The two basic types of bandages which are most commonly used are the ROLLER BANDAGE and the TRIANGULAR BANDAGE.

ROLLER BANDAGE.—The roller bandage, shown in figure 5-1, consists of a long strip of material (usually gauze or muslin) which is wound into a cylindrical shape. Roller bandages come in various widths and lengths. Most of the roller bandages found in first aid kits have been sterilized, so pieces may be cut off and used as compresses in direct contact with wounds. If you use a piece of roller bandage in this way, however, be very careful not to touch it with your hands or with any other unsterile object.

A piece of roller bandage may be used to make a FOUR-TAILED BANDAGE. This is done by splitting the cloth from each end, leaving as large a center area as necessary. Figure 5-2(A) shows a bandage of this kind. The four-tailed bandage is often used to hold a compress on the chin, as shown in figure 5-2(B), or on the nose, as shown in figure 5-2(C). It is particularly good for bandaging any protruding part of the body, because the center portion of the bandage forms a smoothly-fitting pocket when the tails are crossed over.

TRIANGULAR BANDAGES.—Triangular bandages are usually made of muslin. They are made by cutting a 36- to 40-inch square from a

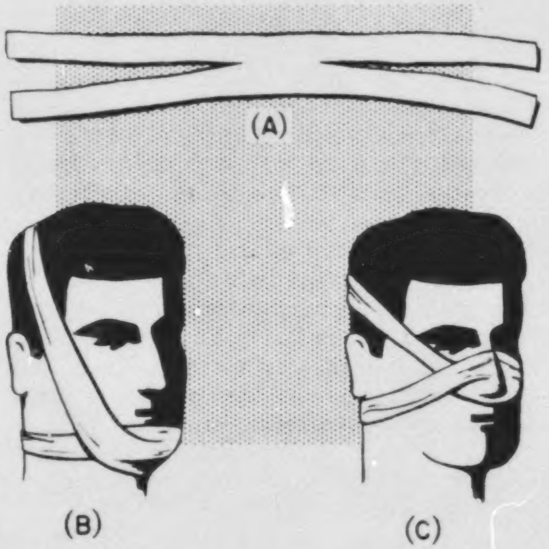

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Figure 5-2.–(A) Four-Tailed Bandage. (B) Four-Tailed Bandage Applied to the Chin. (C) Four-Tailed Bandage Applied to the Nose.

piece of cloth, and then cutting the square diagonally, thus making two triangular bandages. A smaller bandage of this kind may be made by folding a large handkerchief diagonally. The longest side of the triangular bandage is called the BASE; the corner directly opposite the middle of the base is called the POINT; and the other two corners are called ENDS. Figure 5-3 shows a triangular bandage with the base, point, and ends labeled. The triangular bandage is useful because it can be folded in a variety of ways to fit almost any part of the body.

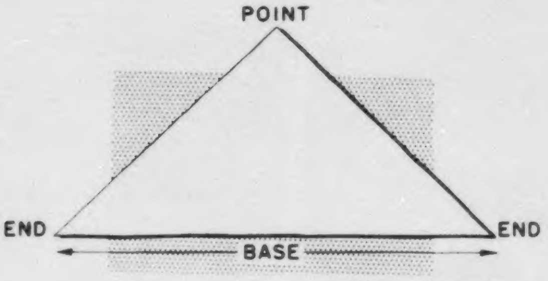

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Figure 5-3.–Triangular Bandage.

The triangular bandage may be folded to form a CRAVAT BANDAGE, which is particularly useful in controlling bleeding from wounds of the scalp or forehead. To make the cravat, bring the point of the triangular bandage down to the base; then fold the bandage lengthwise along the middle. The cravat may then be used, or–if a narrower bandage is desired–it may be folded again along the middle. Figure 5-4 shows how to fold a triangular bandage into a cravat.

If specially prepared bandages are not available, use whatever material you can find. Remember that the basic purpose of a bandage is to hold the sterile compress in place. Any material and any method of application which does not cause further injury to the victim is

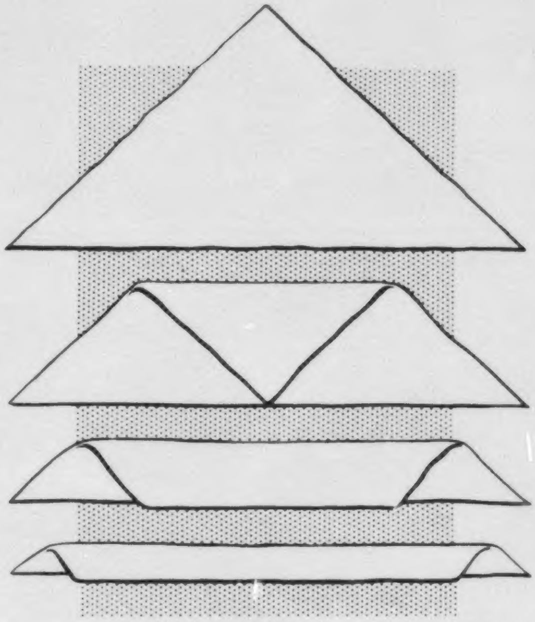

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Figure 5-4.–Cravat Bandage.

adequate if it serves the purpose. Material used as a bandage does not have to be sterile, since it does not come in direct contact with the wound; it should, however, be as clean as possible.

Cloth bandages should be fastened by tying the ends with a SQUARE KNOT or by pinning the ends with strong safety pins. If you use a knot to fasten the bandage, be sure to use a square knot; as you know, this knot is easy to tie, does not slip, and can be untied quickly when necessary. Be sure, also, that you place the knot so as to cause the least possible discomfort to the victim, and that you place it where it can be removed easily and quickly.

As a general rule, bandages should be applied firmly but not tightly. A bandage which is too loose is likely to slip off the wound. A bandage which is too tight may cut off some of the blood supply to the injured part, and may cause severe damage to the blood vessels and to the tissues. When you fasten a bandage around an arm or a leg, leave the fingers or toes exposed; if they become blue or swollen you will know that the bandage is too tight and should be loosened.

TREATING FOR SHOCK

Shock is likely to be severe in a person who has lost a large amount of blood or suffered any serious wound. Keep the casualty lying down on his back, with his feet and legs somewhat elevated–unless, of course, his injuries are such as to prevent the use of this position. Be sure that he is comfortably warm, but do not overheat him.

PREVENTING INFECTION

The treatment of infected wounds is ordinarily a problem for medical personnel. However, you must know something about infected wounds so that you will know what to do if medical help is not immediately available.

Any break in the skin or other body membrane (such as the mucous membrane which lines the nasal passages) is dangerous because it allows micro-organisms (germs) to enter the wound.

Infections are dangerous, especially in the area of the nose and mouth. From this area, infections spread very easily into the bloodstream, causing septicemia (blood poisoning), and into the brain, causing abscesses and infections there. Boils, carbuncles, and infected hair follicles just inside the nostril are perhaps the most common infections which occur in this area. Figure 5-5 shows this danger area.

Never cut or squeeze an infected wound; never attempt to open it in any way. The pus or matter which is usually present in an infected wound contains both live and dead micro-organisms. If you try to open the wound, you will probably force some of the living organisms into the blood stream, where they will be carried by the blood to every part of the body. Serious (sometimes fatal) general infections can result.

Although infection may occur in any wound, it is a particular danger in wounds which do not bleed freely, wounds in which torn tissue

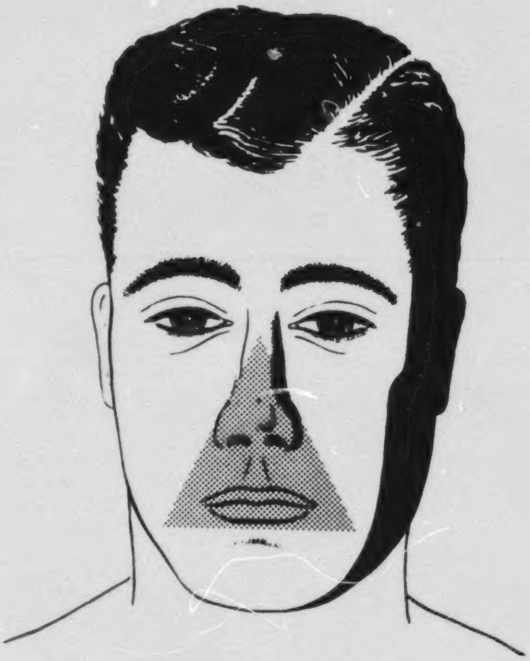

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Figure 5-5.–Danger Zone for Infection.

or skin falls back into place and so prevents the entrance of air, and wounds which involve crushing of the tissues. Incisions, in which there is a free flow of blood and relatively little crushing of the tissues, are least likely to become infected.

Minor wounds should be washed immediately with soap and clean water, dried, and painted with a mild, nonirritating antiseptic. Apply a dressing if necessary. You should not make any attempt to wash or clean a large wound, and you must not apply any kind of antiseptic. Merely cover the wound with a dry sterile compress and fasten the compress in place with a bandage. Further treatment of larger wounds should be administered by medical personnel only.

Remember that PUNCTURE WOUNDS are very likely to become infected. In particular, tetanus (sometimes called "lockjaw") is likely to develop from puncture wounds unless preventive treatment is given in time. All puncture wounds are dangerous, and must be treated by medical personnel.

Animal Bites

A special kind of infection which must be guarded against in the case of ANIMAL BITES is the possibility of rabies (sometimes called "hydrophobia"). This disease is caused by a virus which is present in the saliva of infected animals. The disease occurs most commonly in wild animals, but has been found in domestic animals and household pets; in fact, it is probable that all mammals are susceptible to it. The virus which causes rabies is ordinarily transmitted by a bite, but it can be transmitted by the saliva of an infected animal coming in contact with a fresh wound or with the thin mucous membrane of the lips or nose. The virus does not penetrate normal unbroken skin.

If rabies develops in man, it is usually fatal. A preventive treatment is available which is very effective if it is given within a few days after the bite; this treatment is known as the Pasteur vaccine treatment. Since the vaccine can be given only by medical personnel, any person bitten by an animal MUST receive medical attention at the earliest opportunity. The victim should be transferred to the nearest medical facility, and a complete report of the circumstances should be given. Remember, PREVENTION is of utmost importance.

Immediate local treatment of the wound should be given. Wash the wound and the surrounding area carefully, using sterile gauze, soap, and sterile water. Use sterile gauze to dry the wound, and then cover the wound with a sterile dressing. Do NOT use any chemical disinfectant. Do not attempt to cauterize the wound in any way.

A wound made by an animal bite should be washed immediately and thoroughly; all of the animal's saliva must be removed from the victim's skin in order to prevent further contamination of the wound. (CAUTION: DO NOT allow the animal's saliva to come in contact with open sores or cuts on your hands.)

When a person has been bitten by an animal, every effort must be made to catch the animal and to keep it confined for a period of about 2 weeks. DO NOT kill it if there is any possible chance of catching it alive. The symptoms of rabies are not always present in the animal at the time the bite occurs, but the saliva may nevertheless contain the rabies virus. It is essential, therefore, that the animal be kept under observation until a diagnosis can be made. The Pasteur treatment is given if the animal develops any definite symptoms, if it dies during the observation period, or if for any reason the animal cannot be kept under observation.

Remember that any animal bite is dangerous, and MUST be treated by medical personnel.

REMOVING FOREIGN OBJECTS

Many wounds contain foreign objects. Wood or glass splinters, bullets, metal fragments, bits of wire, fishhooks, nails, tacks, cinders, and small particles from grinding wheels are examples of the variety of objects or materials which are sometimes found in wounds. In some cases, first aid treatment for wounds includes the removal of such objects when they are near the surface and exposed. However, first aid treatment does NOT include the removal of deeply embedded objects, powdered glass, or any widely scattered material of this nature. You should never attempt to remove bullets, but you should try to find out whether the bullet remains in the victim; look for both entrance and exit wounds. The general rule to remember is this: Remove foreign objects from a wound, when you can do so easily and without causing further damage; but NEVER HUNT FOR, OR ATTEMPT TO REMOVE, DEEPLY BURIED OR WIDELY SCATTERED OBJECTS OR MATERIALS.

The following procedures may be used to remove a small object from the skin or tissues, if the object is near the surface and clearly visible:

1. Cleanse the skin around the object with soap and water and paint with any available skin antiseptic solution.

2. If necessary, pierce the skin with a sharp instrument (a needle, a razor, or a sharp knife) which has been sterilized by passing it through a flame several times.

3. Grasping the object at the end, remove it. Tweezers, small pincers, or forceps may be used for this purpose. (Whatever instrument you use should first be sterilized by boiling if at all possible.)

4. If the wound is superficial, apply gentle pressure to encourage bleeding.

5. Cover the wound with a dry sterile dressing.

If the foreign object is under a fingernail or toenail, you may have to cut a V-shaped notch in the nail so that the object can be grasped by the forceps. Do NOT try to dig the object out from under the nail with a knife or similar instrument.

A curved or barbed object such as a fishhook may present special problems. Figure 5-6 shows one method of removing a fishhook which has become embedded in the flesh. As you can see from figure 5-6(A), the barb on the hook prevents its direct removal. However, if you push the hook forward through the skin, as shown in figure 5-6(B), you can clip off the barb with a wire-cutter or similar tool, as shown in figure 5-6(C). The remainder of the fishhook can then be withdrawn in the manner indicated in figure 5-6(D).

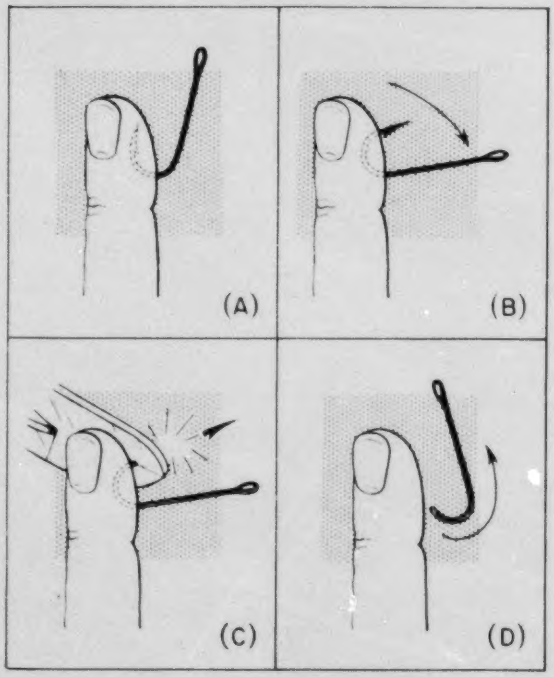

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Figure 5-6.--Removing a Fishhook.

SPECIAL WOUNDS

As we have seen, the basic first aid treatment for all fresh wounds consists of stopping the flow of blood, treating the victim for shock, preventing infection, and—when necessary—removing foreign objects and immobilizing the injured part. Now let's consider some particular wounds.

Avulsion

An avulsion is the tearing away of tissue from a body part. Bleeding is usually heavy. Wrap the tissue in cool, moist toweling, and send it along with the victim to a medical facility. Such tissue can often be successfully reattached.

Amputation

A traumatic amputation is the removal of a limb from the body. Bleeding is heavy and requires the use of a tourniquet to stop it. Treat for shock. When possible, the limb should be wrapped in cool, moist toweling, and transported to the hospital along with the victim.

Eye Wounds

Many eye wounds contain foreign objects. Dirt, coal, cinders, eyelashes, bits of metal, and a variety of other objects may become lodged in the eye. Since even a very small piece of dirt is intensely irritating to the eye, the removal of such objects is very important. However, the eye is very easily damaged. Impairment of vision (or even total loss of vision) can result from fumbling, inexpert attempts to remove foreign objects from the eye. The following precautions MUST be observed:

1. DO NOT allow the victim to rub the eye.
2. DO NOT press against the eye, or manipulate it in any way which might cause the object to become imbedded in the tissues of the eye. Be very gentle; roughness is almost sure to cause injury to the eye.
3. Do NOT use such things as knives, toothpicks, matchsticks, wires, etc., to remove the object.
4. DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO REMOVE AN OBJECT WHICH IS EMBEDDED IN THE EYEBALL OR WHICH HAS PENETRATED THE EYE! If you see a splinter or other object sticking out from the eyeball, leave it alone! Only specially trained medical personnel can hope to save the victim's sight if an object has actually penetrated the eyeball.

Small objects which are lodged on the surface of the eye or on the membrane lining the eyelids can usually be removed by the following procedures:

1. Try to wash the eye gently with lukewarm sterile water. A sterile medicine dropper or a sterile syringe can be used for this purpose. Have the victim lie down, with his head turned slightly to one side as shown in figure 5-7. Hold his eyelids apart. Direct the flow of water to the INSIDE corner of his eye, and let it run down to the OUTSIDE corner. Do not use any greater force than is necessary to keep the water flowing across the eye. Do NOT let the water fall directly onto the eyeball.

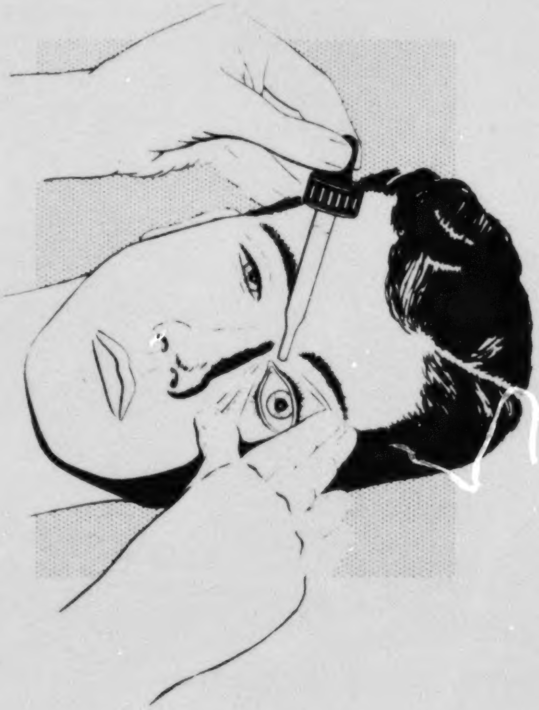

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Figure 5-7.–Washing a Foreign Object From the Eye.

2. Gently pull the lower lid down, and instruct the victim to look up. If you can see the object, try to remove it with the corner of a clean handkerchief or with a small cotton swab. You can make the swab by twisting cotton around a wooden applicator, not too tightly, and moistening it with sterile water. CAUTION: Never use DRY cotton anywhere near the eye. It will stick to the eyeball, or to the inside of the lids, and you will have the problem of removing it, as well as the original object.

3. If you cannot see the object when the lower lid is pulled down, turn the upper lid back over a smooth wooden applicator, as shown in

figure 5-8. Tell the victim to look down. Place the applicator lengthwise across the center of the upper lid. Grasp the lashes of the upper lid gently but firmly. Press very gently with the applicator. Pull up on the eyelashes, turning the lid back over the applicator. If you can see the object, try to remove it with a moist cotton swab or with the corner of a clean handkerchief.

4. If the foreign object cannot be removed by any of the above methods, YOU MUST NOT MAKE ANY FURTHER ATTEMPTS TO REMOVE IT. Instead, place a small, thick gauze dressing over BOTH eyes and hold it in place with a LOOSE bandage. This limits movement of the injured eye.

5. Get medical help for the victim at the earliest opportunity.

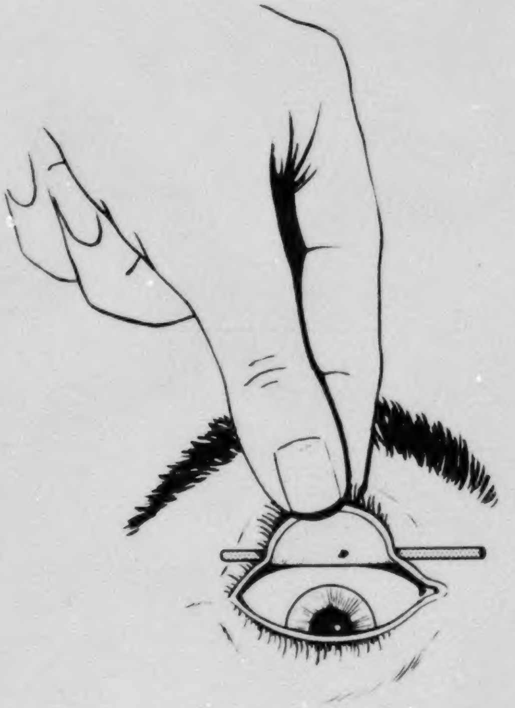

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Figure 5-8.–Turning the Upper Eyelid Back Over a Wooden Applicator.

Head Wounds

Head wounds must be treated with particular care, since there is always the possibility of brain damage with injuries of this kind. The general treatment for head wounds is the same as that for other fresh wounds. However, certain special precautions must be observed if you are giving first aid to a person who has suffered a head wound:

1. NEVER GIVE ANY MEDICINE.

2. Keep the victim lying flat, his head at the level of his body. Do not raise his feet if his face is flushed. If he is having trouble breathing, you may raise his head slightly.

3. If the wound is at the back of the head, turn the victim so that he is lying on his side.

4. Watch closely for vomiting and position the head to avoid aspiration of vomitus or saliva into the lungs.

Facial Wounds

Wounds of the face are treated, in general, like other fresh wounds. However, in all facial injuries, care must be taken to insure that the tongue, or injured soft tissue does not block the airway, causing a breathing obstruction. Keep the nose and throat clear of any obstructing material, and position the victim so that blood will drain out of the mouth and nose.

Facial wounds which involve the eyelids or the soft tissues around the eye must be handled very carefully in order to avoid further damage. If the injury does not involve the eyeball, apply a sterile compress and hold it in place with a FIRM bandage. If the eyeball appears to be injured, use a LOOSE bandage. (Remember that you must NEVER attempt to remove any object which is embedded in the eyeball, or which has penetrated it; just apply a dry sterile compress to cover BOTH eyes and hold it in place with a LOOSE BANDAGE.)

Any person who has suffered a facial wound which involves the eye, the eyelids, or the tissues around the eye must receive medical attention as soon as possible. Be sure to keep him lying down; a stretcher must be used to transport him, so that he will not have to sit or stand.

Chest Wounds

All chest injuries must be considered as serious conditions because any chest injury can cause severe breathing and bleeding problems. Any victim showing signs of difficulty in breathing without signs of airway obstruction must be inspected for chest injuries. The most serious chest injury that requires immediate first aid treatment is the SUCKING CHEST WOUND. This is a penetrating injury to the chest which produces a hole in the chest cavity, causing the lung to collapse, which prevents normal breathing functions. This is an extremely serious condition which will result in death if not treated quickly.

Victims with open chest wounds gasp for breath, have difficulty breathing out and may have a bluish skin color in their face. A sucking sound may or may not be heard at the site of the wound. Frothy looking blood may bubble from the wound during breathing.

The proper treatment for a sucking chest wound is as follows:

1. Immediately seal the wound with a hand or any controllable material available (e.g., ID card).
2. As soon as possible place a large gauze pad over the wound. The pad must be large enough so that it cannot be sucked into the wound when the victim breathes in.
3. Now firmly tape the pad in place with strips of adhesive. It is very important that the dressing is airtight, otherwise, it will not relieve the victim's breathing problems. The object of the dressing is to keep air from going in and going out through the wound.
4. Give the victim oxygen if it is available and you know how to use it.
5. Place the victim in a high sitting position. This makes breathing a little easier.
6. Watch the victim closely for signs of shock and treat accordingly.
7. Do not give victims with chest injuries anything by mouth.
8. Transport the victim to a medical facility immediately.

Abdominal Wounds

A deep wound in the abdomen is likely to constitute a major emergency, since there are many vital organs in this area. Abdominal wounds usually cause intense pain, nausea and vomiting, spasm of the abdominal muscles, and severe shock. Immediate surgical treatment is almost always required; therefore, the victim must receive medical attention at once, or his chances of survival will be very poor. Give only the most essential first aid treatment, and concentrate your efforts on getting the victim to a medical facility. The following first aid procedures may be of help to a person suffering from an abdominal wound:

1. Keep the victim lying down on his back. If the intestine is protruding or exposed, he may be more comfortable with his knees drawn up; place a coat, a pillow, or some other bulky cloth material under his knees to help him maintain this position. DO NOT ATTEMPT TO PUSH THE INTESTINE BACK IN, OR TO MANIPULATE IN ANY WAY!

2. If bleeding is severe, try to stop it by applying direct pressure.

3. Cover the wound with a dry sterile dressing, if the intestine is not exposed. If the intestine is exposed, apply a sterile compress moistened with sterile water. If no sterile water is available, clean seawater or any water which is fit to drink may be used to moisten the compress. Figure 5-9 shows an abdominal wound with the intestine protruding. Figure 5-10 shows the application of compresses large enough to cover the wound and the surrounding area. The compress should be held in place by a bandage. Fasten the bandage firmly, so that the compress will not slip around, but do not apply any more pressure than is necessary to hold the compress in position.

4. Treat for shock–but don't waste any time doing it. The victim must be transported to

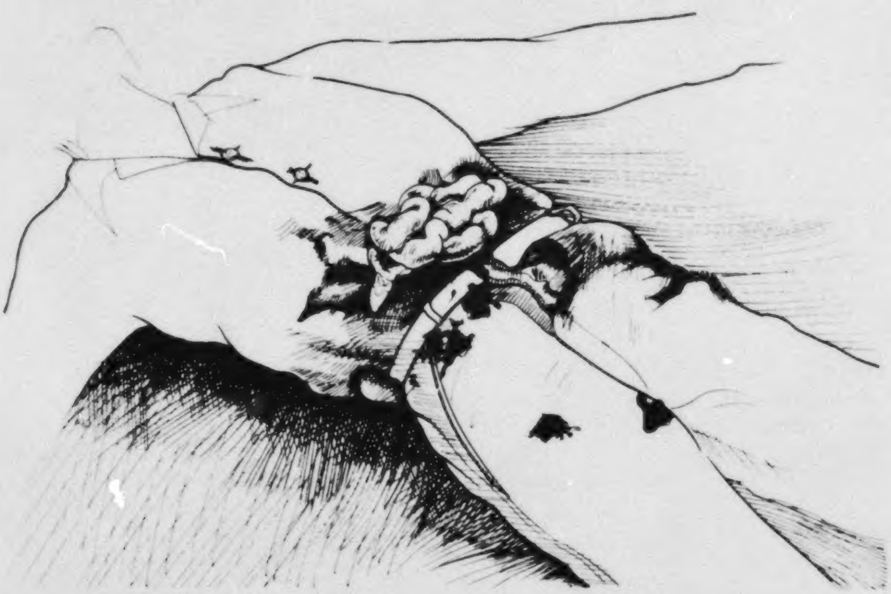

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Figure 5-9.—Abdominal Wound With Protruding Intestine.

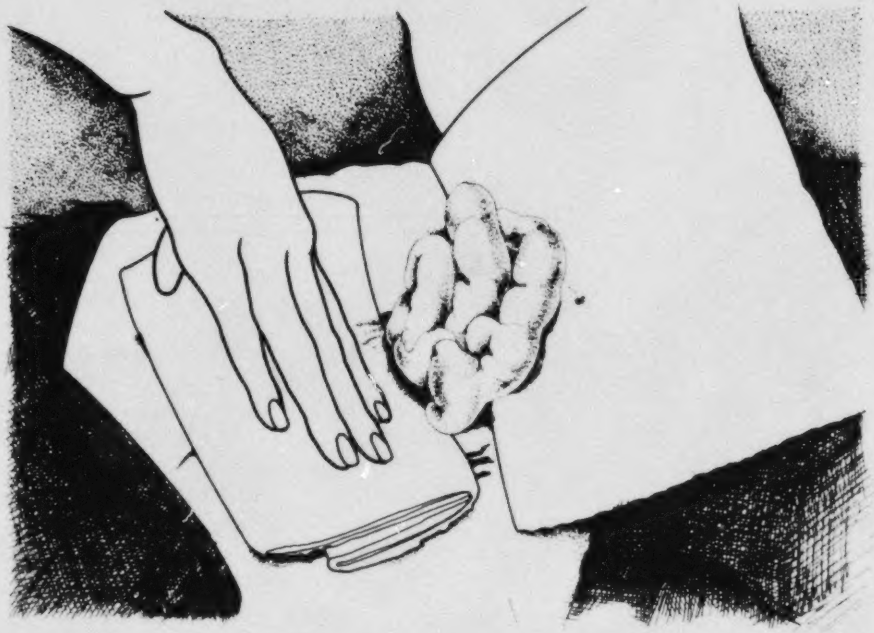

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Figure 5-10.—Covering Protruding Intestine With Sterile Dressings.

a hospital at the earliest possible opportunity. However, you can minimize the severity of shock by making sure that the victim is comfortably warm and by keeping him lying down on his back. DO NOT GIVE HIM ANYTHING TO DRINK. If he complains of great thirst, moisten his mouth with a small amount of water; but do not allow him to swallow any liquid.

Internal Wounds

External blows or impacts which do not break the skin frequently cause extensive internal damage. Internal injuries are not always thought of as wounds, because no blood shows on the surface of the body. However, if you remember the definition of a wound–any injury which causes a break in the skin or other body membranes or in the underlying tissues–you will see that many internal injuries are really wounds.

Internal wounds are frequently caused by pressure waves which result from the detonation of high explosives, either in the air or under water; if caused in this way, the wounds are usually referred to as BLAST or CONCUSSION injuries. Internal wounds may also be caused by any sudden forceful blow such as might occur in fights, in automobile accidents, or in accidents involving some kinds of machinery.

There is relatively little in the way of first aid that can be done for persons suffering from internal wounds. ALL INTERNAL INJURIES ARE SERIOUS. THEY REQUIRE IMMEDIATE MEDICAL ATTENTION. The first aid measures which are used in these cases have two purposes: (1) to minimize the severe shock which almost always accompanies internal injuries; and (2) to prevent further damage. First aid treatment should be given as follows:

1. Keep the victim lying down. If he has a chest wound, he will have difficulty in breathing and may have to be propped up. If he has an abdominal wound, he may be more comfortable with his knees drawn up, keep him lying flat on his back. Do not elevate his feet.

2. Be sure that the victim is comfortably warm, but do not overheat him.

3. Keep him as quiet as possible, and do not move him unless it is absolutely necessary. If you must move him, keep him lying down and handle him with great care. Any movement will probably make the injury worse.

CAUTION: DO NOT give a person anything to drink if you suspect that he has an internal wound. If he complains of great thirst, moisten his mouth with a small amount of water, but do not let him swallow any of it.

CHAPTER 6

INJURIES TO BONES, JOINTS, AND MUSCLES

Many kinds of accidents cause injuries to bones, joints, or muscles. In giving first aid to an injured person, you must always look for signs of fractures (broken bones), dislocations, sprains, strains, and contusions.

An essential part of the first aid treatment for fractures consists of immobilizing the injured part with splints so that the sharp ends of broken bones will not move around and cause further damage to nerves, blood vessels, or vital organs. Splints are also used to immobilize severely injured joints or muscles, and to prevent the enlargement of extensive wounds. You must have a general understanding of the use of splints before going on to learn the detailed first aid treatment for injuries to bones, joints, and muscles.

USE OF SPLINTS

In an emergency almost any firm object or material will serve as a splint. Such things as umbrellas, canes, swords, rifles, tent pegs, laths, sticks, oars, paddles, spars, wire, leather, boards, pillows, heavy clothing, corrugated cardboard, and folded newspapers can be used as splints. A fractured leg may sometimes be splinted by fastening it securely to the uninjured leg.

Splints, whether readymade or improvised, must fulfill certain requirements. They should be light in weight, but they must be strong and fairly rigid. They should be long enough to reach the joints above and below the fracture. Splints should be wide enough so that the bandages which are used to hold them in place will not pinch the injured part. Splints must be well padded on the sides which touch the body; if they are not properly padded, they will not fit well and will not adequately immobilize the injured part. If you have to improvise the padding for a splint, you can use articles of clothing, bandages, cotton, blankets, or any other soft material. If the victim is wearing heavy clothes, you may be able to apply the splint on the outside, thus allowing the clothing to serve as at least part of the required padding.

To apply splints to an injured part, fasten them in place with bandages, strips of adhesive tape, articles of clothing, or any other available material. If possible, one person should hold the splints in position while another person fastens them.

Although splints should be applied snugly, they should NEVER be tight enough to interfere with the circulation of the blood. When you are applying splints to an arm or a leg, try to leave the fingers or toes exposed. If the tips of the fingers or toes become blue or cold, you will know that the splints or bandages are too tight. You should examine a splinted part approximately every half hour, and loosen the fastenings if the circulation appears to be impaired. Remember that any injured part is likely to swell, and splints or bandages which are all right when applied may later be too tight.

INJURIES TO BONES

A break in a bone is called a FRACTURE. There are two main kinds of fractures. A CLOSED FRACTURE is one in which the injury is entirely internal; the bone is broken but there is no break in the skin. AN OPEN FRACTURE is one in which there is an open wound in the tissues and the skin. Sometimes the open wound is made when a sharp end of the broken bone pushes out through the flesh; sometimes it is made by an object such as a bullet which penetrates from the outside. Figure 6-1 shows closed and open fractures. Open fractures are more serious than closed fractures. They usually involve extensive damage to the tissues, and they are quite likely to become infected. Closed fractures are sometimes turned into open fractures by rough or careless handling of the victim.

It is not always easy to recognize a fracture. All fractures, whether closed or open, are likely to cause severe pain and shock; but the other symptoms may vary considerably. A broken bone sometimes causes the injured part to be deformed, or to assume an unnatural position; however, this is not always the case. Pain and swelling may be localized at the point of fracture, and there may be a kind of wobbly movement if the bone is broken clear through. It may be difficult or impossible for the victim to move the injured part; if he is able to move it, he may feel a kind of grating sensation as the ends of the broken bone rub against each other. However, if a bone is cracked rather than broken through, the victim may be able to move the injured part without much difficulty. An open fracture is easy to recognize if an end of the broken bone protrudes through the flesh. If the bone does not protrude, however, you might see the external wound but fail to recognize the broken bone.

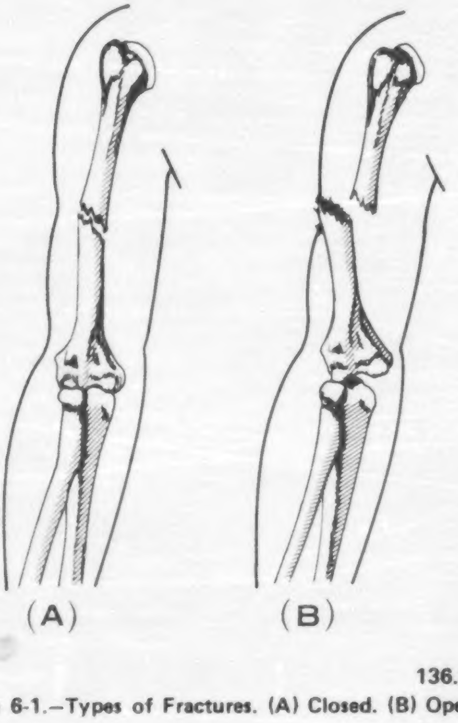

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Figure 6-1.–Types of Fractures. (A) Closed. (B) Open.

If you are required to give first aid to a person who has suffered a fracture, you should follow these general rules:

1. If there is any possibility that a fracture has been sustained, treat the injury as a fracture.

2. Get medical aid at the first possible opportunity. All fractures require medical treatment.

3. Do not move the victim until the injured part has been splinted, unless you must move him in order to save his life or prevent further injury.

4. Treat for shock.

5. Do not attempt to locate a fracture by grating the ends of the bone together.

6. Do not attempt to set a broken bone.

7. When a long bone in the arm or leg is fractured, the limb should be carefully straightened so that splints can be applied. Never attempt to straighten the limb by applying force or traction with any improvised windlass or other device. Pulling gently with your hands in the long axis of the limb is permissible, and may be all that is necessary to get the limb back into position.

8. Apply splints. If the victim is to be transported only a short distance, or if he will be seen very soon by a medical officer, it is probably best to leave his clothing on and place emergency splinting over it. However, if the victim must be transported for some distance, or if a considerable period of time will elapse before he can be treated by a medical officer, it may be better to remove enough clothing so that

you can apply well-padded splints directly to the injured part. If you decide to remove clothing over the injured part, cut the clothing or rip it along the seams. In any case, BE CAREFUL! Rough handling of the victim may convert a closed fracture into an open fracture, increase the severity of shock, and cause extensive damage to the blood vessels, nerves, muscles, and other tissues around the broken bone.

9. If the fracture is open, you must take care of the wound before you can deal with the fracture. Bleeding from the wound may be quite serious; however, most bleeding can be stopped by direct pressure on the wound or by digital pressure at the appropriate point. If these methods are not successful, use a tourniquet. (Methods of stopping serious bleeding are described in ch. 3.) When you have stopped the bleeding, give whatever further treatment is necessary for the wound, according to the principles discussed in chapter 5. Then treat the fracture.

Now that we have seen the general rules for treating fractures, let's take up the symptoms and emergency treatment of fractures of the forearm, upper arm, thigh, leg, kneecap, collarbone, rib, nose, jaw, skull, spine and pelvis.

Fracture of the Forearm

There are two large bones in the forearm. When both are broken the arm usually appears to be deformed. When only one bone is broken, however, the other acts as a splint and the arm therefore retains a more or less natural appearance. Any fracture of the forearm is likely to result in pain, tenderness, inability to use the forearm, and a kind of wobbly motion at the point of injury. If the fracture is open there will of course be an open wound, through which the bone may show.

TREATMENT.–If the fracture is open, stop the bleeding and treat the wound. Apply a sterile dressing over the wound.

Carefully straighten the forearm. (Remember that rough handling of a closed fracture may turn it into an open fracture.)

Apply two well-padded splints to the forearm, one on the top and one on the bottom. Be sure that the splints are long enough to extend from the elbow to the wrist. Use bandages to hold the splints in place.

Put the forearm across the chest. The palm of the hand should be turned in, with the thumb pointing upward. Support the forearm in this position by means of a wide sling, as shown in figure 6-2. The hand should be raised about 4 inches above the level of the elbow.

As in all cases of fracture, treat the victim for shock and get medical attention for him as soon as possible.

Fracture of the Upper Arm

The signs of fracture of the upper arm include pain, tenderness, swelling, and wobbly motion at the point of fracture. If the fracture is near the elbow, the arm is likely to be straight, with no bend at the elbow.

TREATMENT.–If the fracture is open, stop the bleeding and treat the wound before attempting to treat the fracture.

NOTICE THAT TREATMENT OF THE FRACTURE DEPENDS PARTLY UPON THE LOCATION OF THE BREAK.

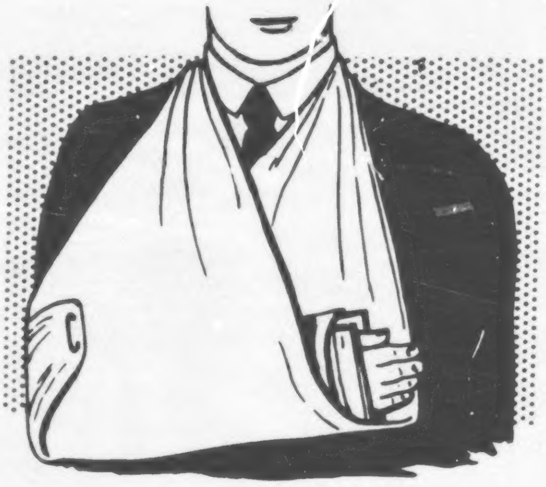

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Figure 6-2.–Sling Used to Support a Fractured Forearm.

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If the fracture is in the upper part of the arm, near the shoulder, place a pad or folded towel in the armpit, bandage the arm securely to the body, and support the forearm in a narrow sling.

If the fracture is in the middle of the upper arm, you can use one well-padded splint on the outside of the arm. The splint should extend from the shoulder to the elbow. Fasten the splinted arm firmly to the body, and support the forearm in a narrow sling, as shown in figure 6-3.

Another way of treating a fracture in the middle of the upper arm is to fasten two wide splints, or four narrow ones, about the arm, and support the forearm in a narrow sling. If you use a splint between the arm and the body, be very careful that it does not extend too far up into the armpit; a splint in this position can cause a dangerous compression of the blood vessels and nerves and may be extremely painful to the victim.

If the fracture is at or near the elbow, you may find the victim with his arm either bent or straightened out. NO matter what position you find the arm in, DO NOT ATTEMPT TO STRAIGHTEN IT OR TO MOVE IT IN ANY WAY. As carefully as possible, splint the arm in the position in which you find it.

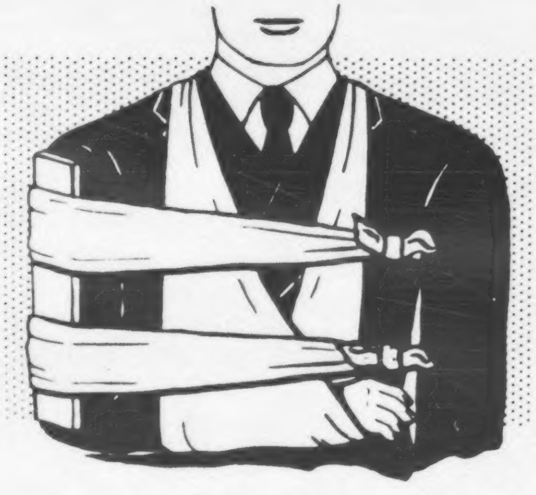

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Figure 6-3.–Splint and Sling for Fractured Upper Arm.

Treat the victim for shock, and get him under the care of a medical officer as soon as possible.

Fracture of the Thigh

The thighbone is the long bone of the upper part of the leg, between the kneecap and the pelvis. When the thighbone is fractured, any attempt to move the limb results in a spasm of the muscles and causes excruciating pain. The leg has a wobbly motion, and there is complete loss of control below the fracture. The limb usually assumes an unnatural position, with the toes pointing outward. The fractured leg is shorter than the uninjured one, by actual measurement, due to the pull of the powerful thigh muscles. Serious damage to blood vessels and nerves often results from a fracture of the thighbone. Shock is likely to be severe.

TREATMENT.–If the fracture is open, stop the bleeding and treat the wound before attempting to treat the fracture itself. Serious bleeding is a special danger in this type of injury, since the broken bone may tear or cut the large artery in the thigh.

Carefully straighten the leg. Apply two splints, one on the outside of the injured leg and one on the inside. The outside splint should reach from the armpit to the foot. The inside splint should reach from the crotch to the foot. The splints should be fastened in five places: (1) Around the ankle; (2) over the knee; (3) just below the hip; (4) around the pelvis; and (5) just below the armpit. Both legs should be tied together, in order to support the injured leg as firmly as possible.

It is essential that a fractured thigh be splinted before the victim is moved. Readymade splints are best but improvised splints may be used. Figure 6-4 shows how boards may be used as an emergency splint for a fractured thigh. Remember, DO NOT MOVE THE VICTIM UNTIL THE INJURED LEG HAS BEEN IMMOBILIZED!

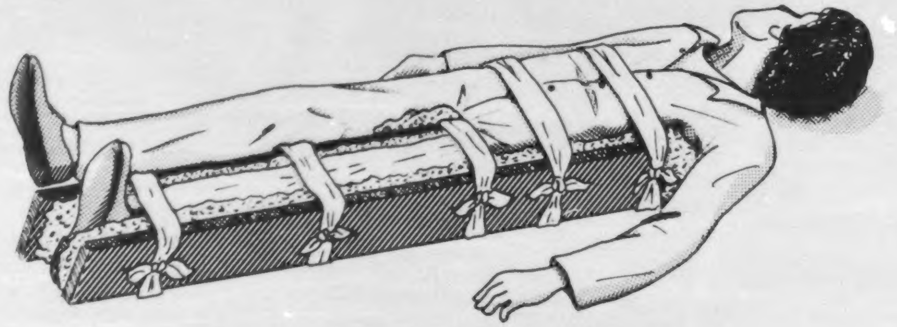

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Figure 6-4.–Boards Used as Emergency Splint for Fractured Thigh.

Treat the victim for shock, and get medical care for him at the earliest possible opportunity.

Fracture of the Lower Leg

When both bones of the lower leg are broken, the usual signs of fracture are likely to be present. When only one bone is broken, the other one acts as a splint and thus to some extent prevents deformity of the leg. However, tenderness, swelling and pain at the point of fracture are almost always present. A fracture just above the ankle is often mistaken for a sprain. If both bones of the lower leg are broken, an open fracture is very likely to result.

TREATMENT.–If the fracture is open, stop the bleeding and treat the wound. Carefully straighten the injured leg. Apply THREE splints–one on each side of the leg and one underneath. Be sure that the splints are well padded, particularly under the knee and at the bones on each side of the ankle.

A pillow and two side splints work very well for treatment of a fractured lower leg. Place the pillow beside the injured leg, then carefully lift the leg and place it in the middle of the pillow. Bring the edges of the pillow around to the front of the leg, and pin them together. Then place one splint on each side of the leg, over the pillow, and fasten them in place with strips of bandage or adhesive tape.

Treat the victim for shock, and get medical care for him as soon as possible.

Fracture of the Kneecap

The following first aid treatment should be given for a fractured kneecap:

Carefully straighten the injured limb. Immobilize the fracture by placing a padded board under the injured limb. The board should be at least 4 inches wide, and should reach from the buttock to the heel. Place extra padding under the knee and just above the heel, as shown in figure 6-5. Use strips of bandage to fasten the leg to the board in four places: (1) Just below the knee; (2) just above the knee; (3) at the ankle; and (4) at the thigh. DO NOT COVER THE KNEE ITSELF! Swelling is likely to occur very rapidly, and any bandage or tie fastened over the knee would quickly become too tight.

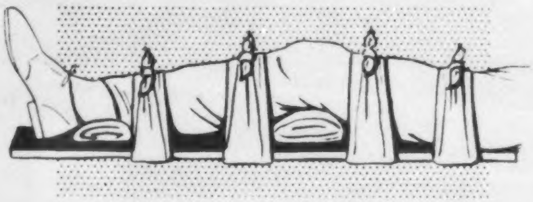

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Figure 6-5.–Immobilization of Fractured Kneecap.

Treat the victim for shock, and obtain medical aid as soon as possible.

Fracture of the Collarbone

A person with a fractured collarbone usually shows rather definite symptoms. When the victim stands, the injured shoulder is lower than the uninjured one. He is usually unable to raise his arm above the level of his shoulder. He may attempt to support the injured shoulder by holding the elbow of that side in his other hand–that is, in fact, a characteristic position assumed by a person with a broken collarbone. Since the collarbone lies very near the skin, you may be able to detect the point of fracture by deformity and localized pain and tenderness.

TREATMENT.–If the fracture is open, stop the flow of blood and treat the wound before attempting to treat the fracture.

Bend the victim's arm on his injured side, and place the forearm across his chest. The palm of his hand should be turned in, with the thumb point up. The hand should be raised about 4 inches above the level of the elbow. Support the forearm in this position by means of a wide sling.

Use a wide roller bandage (or any wide strip of cloth) to fasten the victim's arm to his body. The bandage should make several turns around the victim's body, and should go down over the hand so that the arm will be held close against the body.

Treat the victim for shock, and see that he receives medical attention as soon as possible.

Fracture of the Rib

If ribs are broken, the victim should be made comfortable and quiet so that the greatest danger, the possibility of further damage to the lungs, heart, or chest wall caused by the broken ends, is minimized.

The common finding in all victims with fractured ribs is pain localized at the site of the fracture. By asking the patient to place his hand on the exact area of the pain, you can often determine the location of the injury. There may or may not be a rib deformity or chest wall contusion or laceration of the area. Deep breathing, coughing, or movement is usually quite painful. The patient generally wishes to remain still and may often lean toward the injured side with his hand over the fractured area to immobilize the chest and to ease the pain.

Ordinarily rib fractures are not bound, strapped, or taped if the victim is reasonably comfortable. However, they may be splinted by the use of external support. If the patient is considerably more comfortable with his chest immobilized, the best method is to use a swathe bandage (figure 6-6) in which the arm on the injured side is strapped to the chest to limit motion. Place the arm on the injured side against the chest, palm flat, thumb up with forearm raised to a forty-five degree angle. Immobilize the chest using wide strips of bandage to secure the arm to the chest.

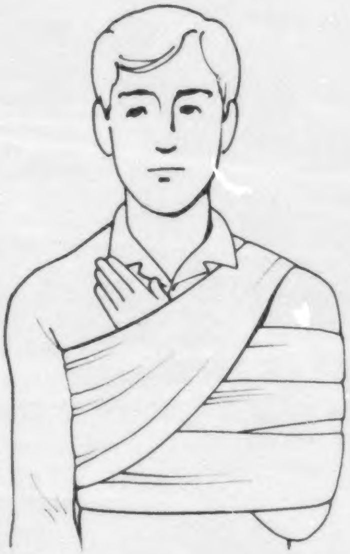

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Figure 6-6.–Swathe Bandaging of Fractured Rib Victim.

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Wide strips of adhesive plaster applied directly to the skin of the chest for immobilization should not be used since the adhesive tends to limit the ability of the chest to expand and thus interferes with proper breathing.

Treat the victim for shock, and see that he receives medical attention as soon as possible.

Fracture of the Nose

A fracture of the nose usually causes localized pain and swelling, a noticeable deformity of the nose, and extensive nosebleed.

TREATMENT.–Stop the nosebleed. Have the victim sit quietly, with his head tipped slightly backward. Tell him to breathe through his mouth, and tell him not to blow his nose. If the bleeding does not stop within a few minutes, apply a cold compress or an ice bag over the nose.

Treat the victim for shock, and see that he receives medical attention as soon as possible. Permanent deformity of the nose may result if the fracture is not treated promptly.

Fracture of the Jaw

A person who has a fractured jaw may suffer a serious interference with breathing. He is likely to have great difficulty in talking, chewing, or swallowing. Any movement of the jaw causes pain. The teeth may be out of line, and there may be bleeding from the gums. Considerable swelling may develop.

TREATMENT.–One of the most important phases of emergency care is to clear the upper respiratory passage of any obstruction. If the fractured jaw interferes with breathing, pull the lower jaw and the tongue well FORWARD and keep them in that position.

Apply a four-tailed bandage, as shown in figure 6-7. Be sure that the bandage pulls the lower jaw FORWARD. Never apply any bandage which forces the jaw backward, since this might cause a serious interference with breathing. The bandage must be firm, so that it will support and immobilize the injured jaw, but it must not press against the victim's throat. Be sure that the victim has scissors or a knife to cut the bandage in case of vomiting. Treat the victim for shock, and get medical attention for him as soon as possible.

Fracture of the Skull

When a person suffers a head injury, the greatest danger is that the brain may be severely damaged; whether or not the skull is fractured is a matter of secondary importance. In some cases, injuries which fracture the skull do not cause serious brain damage; but brain damage can, and frequently does, result from apparently slight injuries which do not cause damage to the skull itself.

It is often difficult to determine whether an injury has affected the brain, because the symptoms of brain damage vary greatly. Any person who has suffered a head injury of any sort must be handled very carefully and given immediate medical attention.

Some of the symptoms which may indicate brain damage are listed below. However, you must remember that these symptoms are not always present in any one case, and that the

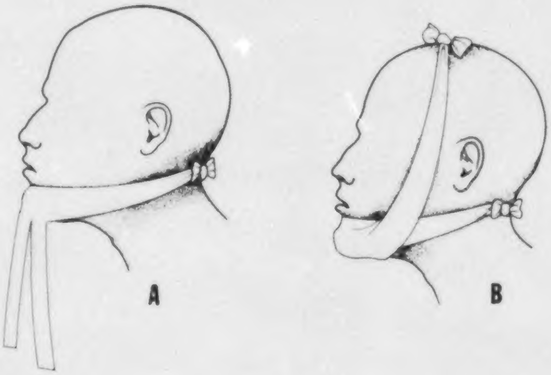

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Figure 6-7.–Four-Tailed Bandage for a Fractured Jaw.

symptoms which do occur may be greatly delayed.

1. Bruises or wounds of the scalp may indicate that the victim has sustained a blow to the head. Sometimes the skull is actually depressed ("caved in") at the point of impact. If the fracture is open, you may find bullets, glass, shrapnel, or other objects actually penetrating the skull.

2. The victim may be conscious or unconscious. If he is conscious, he may feel dizzy and weak, as though he were going to faint.

3. Severe headache sometimes (but not always) accompanies head injuries.

4. The pupils of the eyes may be unequal in size, and may not react normally to light.

5. There may be bleeding from the ears, nose, or mouth.

6. The victim may vomit.

7. The victim may be restless, and perhaps confused and disoriented.

8. The arms, legs, face, or other parts of the body may be partially paralyzed.

9. The victim's face may be very pale, or it may be unusually flushed.

10. The victim is very likely to be suffering from shock, but the symptoms of shock may be disguised by other symptoms.

It is not necessary to determine whether or not the skull is actually fractured, when you are giving first aid to a person who has suffered a head injury. The treatment is the same in either case, and the primary intent is to prevent further damage to the brain.

TREATMENT.–Keep the victim lying down. If his face is flushed, raise his head and shoulders slightly. If his face is pale, have him lie so that his head is level with, or slightly lower than, his body. Watch carefully for vomiting. If the victim begins to vomit, position his head so that he does not choke on the vomitus.

If there is serious bleeding from the wounds, try to control it by the application of direct pressure, utilizing caution to avoid further injury to the skull or brain.

Be very careful about moving or handling the victim. Do not move him any more than necessary. If you must transport him, keep him lying down.

Be sure that the victim is kept comfortably warm, but do not overheat him.

Do NOT give the victim anything to drink. DO NOT GIVE ANY MEDICINES!

See that the victim receives medical attention as soon as possible!

Fracture of the Spine

The spinal cord, which contains nerve fibers in direct connection with the brain, is enclosed and protected by a bony structure known as the SPINAL COLUMN, or BACKBONE. The spinal column is made up of a number of small bones called VERTEBRAE.

If the spine is fractured at any point, the spinal cord may be crushed, cut, or otherwise damaged so severely that death or paralysis will result. However, if the fracture occurs in such a way that the spinal cord is not seriously damaged, there is a very good chance of complete recovery–PROVIDED the victim is properly cared for. Any twisting or bending of the neck or back, whether occurring from the original injury or from careless handling later, is likely to cause irreparable damage to the spinal cord.

The primary symptoms of a fractured spine are pain, shock, and paralysis. PAIN is likely to be acute at the point of fracture. It may radiate to other parts of the body. SHOCK is usually severe, but (as in all injuries) the symptoms may be delayed for some time. PARALYSIS occurs if the spinal cord is seriously damaged. If the victim cannot move his legs, feet, or toes, the fracture is probably in the back; if he cannot move his fingers, the neck is probably broken. Remember, however, that a spinal fracture does not always injure the spinal cord, so the victim is not always paralyzed. Any person who has an acute pain in the back or the neck, following an injury, should be treated as though he has a fractured spine, even if he has no other symptoms.

First aid treatment for all spinal fractures, whether of the neck or of the back, has two primary purposes: (1) to minimize shock, and (2) to prevent further injury to the spinal cord.

You must keep him comfortably warm.

You must not attempt to keep him in the position ordinarily used for the treatment of shock, because getting him into this position might cause further damage to the spinal cord. Just keep him lying flat, and do NOT attempt to lower his head.

In order to avoid further damage to the spinal cord, DO NOT MOVE THE VICTIM UNLESS IT IS ABSOLUTELY ESSENTIAL. If he is lying in a place where his life is in immediate danger, or if he must be transported to some other place in order to receive medical attention, then of course you must move him. If it is necessary to move him, however, be very sure that you do it in a way which will cause the least possible damage. DO NOT BEND OR TWIST THE VICTIM'S BODY, DO NOT MOVE THE HEAD FORWARD, BACKWARD, OR SIDEWAYS, DO NOT UNDER ANY CIRCUMSTANCES ALLOW THE VICTIM TO SIT UP.

If it is necessary to transport a person who has suffered a fracture of the spine, follow these general rules:

1. If the spine is broken at the NECK, the victim must be transported lying on his back, FACE UP. Place pillows or sandbags beside his head so that it cannot turn to either side. Do NOT put pillows or padding under his neck or head.

2. If you suspect that the spine is fractured, but do not know the location of the break, treat the victim as though he had a broken neck—that is, keep him lying on his back, FACE UP. If both the neck and the back are broken, keep the victim on his back, FACE UP.

3. No matter where the spine is broken, USE A FIRM SUPPORT IN TRANSPORTING THE VICTIM. Use a rigid stretcher, or a door, shutter, wide board, or a frame similar to that shown in figure 6-8. Pad the support carefully, and put blankets both under and over the victim. Use cravat bandages or strips of cloth to fasten the victim firmly to the support.

4. Hold the victim by his clothing and slide or pull him onto the support. DO NOT ATTEMPT TO LIFT HIM UNLESS YOU HAVE ADEQUATE ASSISTANCE! Remember, any bending or twisting of the body is almost sure to cause serious damage to the spinal cord. If there are at least four (preferably six) men present to help lift the victim, they can probably accomplish the job without too much movement of the victim's body, but a smaller number of men should NEVER attempt to lift the victim.

5. Get medical help at once!

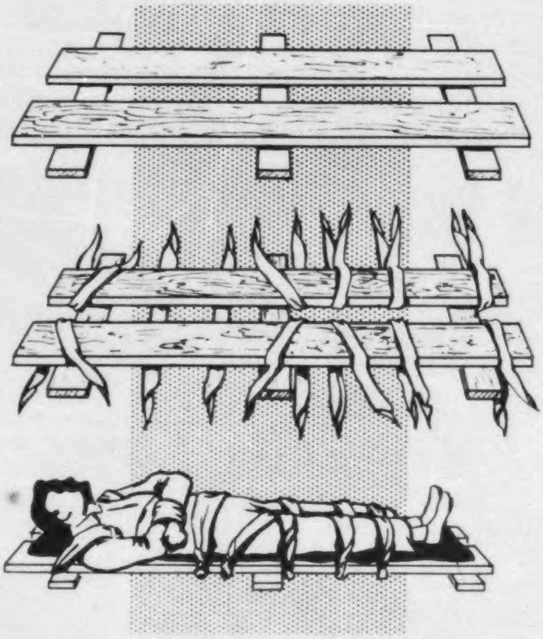

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Figure 6-8.—Improvised Frame for Transporting Victim with Fractured Spine.

Fracture of the Pelvis

The large pelvic bones (sometimes called hipbones) and the lower bone of the spinal column together make up the bony structure which is known as the PELVIS. The joint between the thighbone (the long bone of the upper part of the leg) and the pelvic bone is called the HIP JOINT.

Fractures in the pelvic region often result from falls, heavy blows, and accidents which involve crushing. The great danger in any pelvic fracture is that the organs which are enclosed and protected by the pelvis may be seriously damaged when the bony structure is fractured. In particular, there is danger that the bladder will be ruptured. There is also danger of severe internal bleeding, because the large blood vessels in the pelvic region may be torn or cut by fragments of the broken bone.

The primary symptoms of a fractured pelvis are severe pain, shock, and loss of ability to use the lower part of the body. The victim is unable to sit or stand. If he is conscious, he may feel as though he is "coming apart." If the bladder is injured, the victim's urine may be bloody.

TREATMENT.–Do not move the victim unless ABSOLUTELY necessary!

Treat the victim for shock. Keep him comfortably warm. DO NOT attempt to move him into the position ordinarily used for the treatment of shock.

If you must transport the victim to another place, handle him with the utmost care. Use a rigid stretcher or a padded door or wide board. Keep the victim lying on his back. In some cases he will be more comfortable if his legs are straight; in other cases he will be more comfortable with his knees bent and his legs drawn up. When you have placed him in the position in which he is most comfortable, immobilize him as shown in figure 6-9. Bandage his legs together at the ankles and at the knees. Then place a pillow beside each hip, and fasten the pillows in place with bandages or strips of cloth. Fasten the victim securely to the stretcher or improvised support. Get medical help at once!

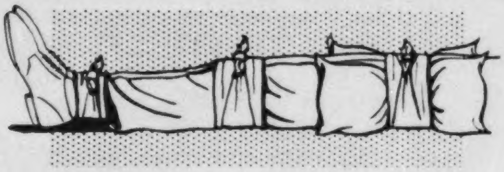

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Figure 6-9.–Method of Immobilizing Fractured Pelvis.

INJURIES TO JOINTS AND MUSCLES

Injuries to joints and muscles often occur together, and sometimes it is difficult to tell whether the primary injury is to a joint or to the muscles, tendons, blood vessels, and nerves near the joint. Sometimes, also, it is quite difficult to distinguish joint or muscle injuries from fractures. In case of doubt, ALWAYS treat any injury to a bone, joint, or muscle as though it were a fracture.

In general, joint and muscle injuries may be classified under four headings: (1) dislocations; (2) sprains; (3) strains; and (4) contusions (bruises). Now let's take up these four types of injuries, and see how to recognize them and how to treat them.

Dislocations

When a bone is forcibly displaced from its joint, the injury is known as a DISLOCATION. In some cases the bone slips back quickly into its normal position, but in other cases it becomes locked in the new position and remains dislocated until it is put back into place. Dislocations are usually caused by falls or blows, but are occasionally caused by violent muscular exertion. The joints which are most frequently dislocated are those of the shoulder, hip, finger, and jaw.

A dislocation is likely to bruise or tear the muscles, ligaments, blood vessels, tendons, and nerves near the joint. Rapid swelling and discoloration, loss of ability to use the joint, and severe pain and shock are characteristic symptoms of dislocations. The fact that the injured part is usually stiff and immobile, with marked deformation at the joint, will help you to distinguish a dislocation from a fracture. (In a fracture, you remember, there is a deformity BETWEEN joints rather than AT joints, and there is generally a wobbly motion of the broken bone at the point of fracture.)

As a general rule, you should NOT attempt to "reduce a dislocation"–that is, put a dislocated bone back into place–unless you know that medical assistance cannot be obtained within 3 or 4 days. Unskilled attempts at reduction may cause great damage to nerves and blood vessels, or may actually fracture the bone. Except in great emergencies, therefore, you should leave this treatment to medical personnel, and concentrate your efforts on making the victim as comfortable as possible under the circumstances. The following first aid measures will be helpful:

1. Loosen the clothing around the injured part.
2. Place the victim in the most comfortable position possible.
3. Support the injured part by means of a sling, pillows, bandages, splints, or any other device which will make the victim comfortable.
4. Treat the victim for shock.
5. Get medical help as soon as possible.

You should NEVER attempt to reduce the more serious dislocations, such as those of the shoulder or the hip. However, if it is probable that the victim cannot be treated by a medical officer within a REASONABLE TIME, you should make a careful effort to reduce minor dislocations, such as those of the jaw or the finger.

DISLOCATION OF THE JAW.–When the lower jaw is dislocated, the victim cannot speak and cannot close his mouth. Dislocation of the jaw is usually caused by a blow on the mouth; sometimes it is caused by yawning or laughing. This type of dislocation is not always easy to reduce, and there is considerable danger that the operator's thumbs will be bitten in the process. For your own protection, therefore, you must wrap your thumbs with a handkerchief or bandage. Stand in front of the victim, facing him. Press your thumbs down just behind the victim's last lower molars and, at the same time, lift his chin up with your fingers. The jaw should snap into place at once; you will have to remove your thumbs quickly in order to avoid being bitten. No further treatment is required, but you should warn the victim not to open his mouth any more than necessary during the next few hours.

Figure 6-10 shows the position you must assume in order to reduce a dislocated jaw.

DISLOCATION OF THE FINGER.–The joints of the finger are particularly susceptible to injury, and even minor injuries may result in prolonged loss of function. Great care must be used in treating any injury of the finger.

To reduce a dislocation of the finger, grasp the finger firmly and pull it slowly into position. If it does not slip into position, try it once more;

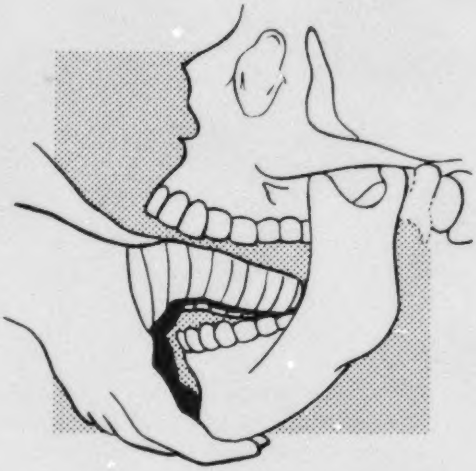

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Figure 6-10.–Positioning for Reducing Dislocated Jaw.

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but if it does not go into position on the second attempt, DO NOT TRY AGAIN. In any case, whether or not the dislocation is reduced, the finger should be strapped or splinted until the victim can receive medical attention. Figure 6-11 shows how a dislocated finger can be immobilized by strapping it to a flat wooden stick, such as a tongue depressor.

Sprains

A SPRAIN is an injury to the ligaments which support a joint. A sprain usually involves a momentary dislocation, with the bone slipping back into place of its own accord. A sprain is caused by the violent wrenching or twisting of the joint beyond its normal limits of movement. Although any joint may be sprained, sprains of the ankle, wrist, knee, and finger are most common.

Tearing of the supporting ligaments is probably the most serious part of a sprain, but there is also a considerable amount of damage to the blood vessels and other soft tissues which surround the joint. When the blood vessels are damaged, quite a lot of blood escapes into the joint itself and into the tissues. This causes the severe pain and marked swelling which are characteristic of a sprain.

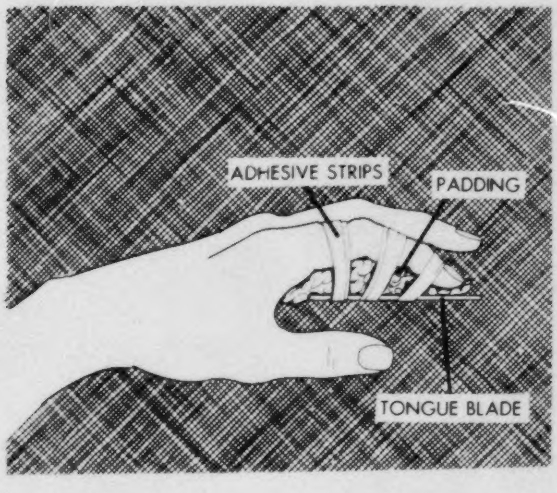

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Figure 6-11.–Immobilization of Dislocated Finger.

TREATMENT.–Immobilize the injured joint with some type of splint or with a snugly-fitting adhesive or elastic bandage, in order to put the injured ligaments at rest. (Be careful to loosen the bandage if it becomes so tight that it interferes with the circulation of the blood. Remember that the injured part may continue to swell, so a bandage which is loose enough when applied may soon be too tight.)

Elevate the injured part, if possible; this will help to reduce the pain and swelling.

Apply COLD cloths or an ice bag to the injured joint for the first 24 hours, and HEAT compresses after 24 hours.

CAUTION: It is very difficult to tell the difference between a sprain and a fracture. If you are not sure which injury is present, always treat it as a fracture until the victim has been brought under the care of a medical officer or until improvement more or less rules out the possibility of fracture.

Strains

An injury caused by the forcible overstretching or tearing of a muscle or tendon is known as a STRAIN. Strains may be caused by lifting excessively heavy loads, by sudden or violent movements, or by any other action which pulls the muscles beyond their normal limits.

The chief symptoms of a strain are pain, lameness or stiffness (sometimes involving knotting of the muscles), moderate swelling at the place of injury, and discoloration due to the escape of blood from injured blood vessels into the tissues.

TREATMENT.–Rest the injured part. If the injured muscle is in an arm or leg, elevate the part. Apply COLD to the area by means of cold compresses or an ice bag.

Contusions

CONTUSIONS, commonly called BRUISES, are responsible for the discoloration which almost always accompanies injuries to bones, joints, and muscles. Contusions are caused by blows which damage bones, muscles, tendons, blood vessels, nerves, and other body tissues, although they do not necessarily break the skin.

The symptoms of a contusion, or bruise, are familiar to everyone. There is immediate pain when the blow is received. Swelling occurs because blood from the broken blood vessels oozes into the soft tissues under the skin. At first the injured place is reddened, due to local skin irritation from the blow; later the characteristic "black and blue" marks appear; and finally, perhaps several days later, the skin is yellowish or greenish in color. The bruised area is usually very tender.

TREATMENT.–As a rule, slight bruises do not require treatment. However, if the victim has severe bruises, treat him for shock.

Immobilize the injured part. Keep it at rest, and protect it from further injury. Sometimes the victim will be more comfortable if the bruised area is bandaged firmly with an elastic or gauze bandage.

If possible, elevate the injured part. A sling may be used for a bruised arm or hand. Pillows or folded blankets may be used to elevate a bruised leg.

Apply COLD cloths or an ice bag to a fresh bruise.

CAUTION: Extensive bruises may be very serious. In such cases, always get medical attention for the victim as soon as possible.

CHAPTER 7

INJURIES FROM HEAT AND COLD

Exposure to extremes of temperature–whether of heat or of cold–causes injury to skin, tissues, blood vessels, vital organs, and in some cases to the entire body. In this chapter we will take up the injuries which are caused by extremes of heat or cold, the first aid treatment which should be given for them, and some of the preventive measures which may be taken to avoid them.

HEAT INJURIES

Burns, heatstroke, heat exhaustion, and heat cramps are the injuries most commonly caused by exposure to extreme heat. "Burns" caused by contact with acids, alkalis, and other chemicals, are not true heat burns. However, they will be discussed here because many people think of them as burns and do not realize that they require special treatment.

Burns and Scalds

Burns and scalds are caused by exposure to intense heat, such as that generated by fire, bomb flash, sunlight, hot solids, hot gases, and hot liquids. Contact with electric current also causes burns, particularly if the skin is dry. (Dry skin offers about 20 times more resistance than moist skin to the passage of electric current; when the skin is dry, therefore, the local heating effects (burns) are greater, even though the total damage to the body is less than when the skin is wet.)

It should be noted that burns and scalds are essentially the same type of heat injury. When the injury is caused by dry heat, it is called a burn; when caused by moist heat, it is called a scald. Treatment is the same in both cases.

CLASSIFICATION OF BURNS.–Burns are classified in several ways–by the extent of the burned surface, by the depth of the burn, and by the cause of the burn. Of these, the extent of body surface burned is the most important factor in determining the seriousness of the burn and plays the greatest role in the casualty's chances for survival.

In calculating the extent of burned surface, the RULE OF NINES is used (fig. 7-1). These figures aid in determining the correct treatment for the burned person. Shock can be expected in adults with burns of over 15 percent or small children with burns of over 10 percent of body surface area. In adults, burns involving more than 20 percent endanger life, and 30 percent burns are usually fatal if adequate medical treatment is not received.

The depth of injury to the tissues is spoken of in degrees. FIRST DEGREE burns are the mildest, producing redness, increased warmth, tenderness, and mild pain. SECOND DEGREE burns redden and blister the skin and are characterized by severe pain. THIRD DEGREE burns destroy the skin and may destroy muscle tissue and bone in severe cases. Severe pain may be absent because nerve endings have been destroyed. The color may vary from white and lifeless (scalds) to black (charred from gasoline explosions). Figure 7-2 shows the appearance of first, second, and third degree burns.

It is important to remember that the size of the burned area may be far more important than

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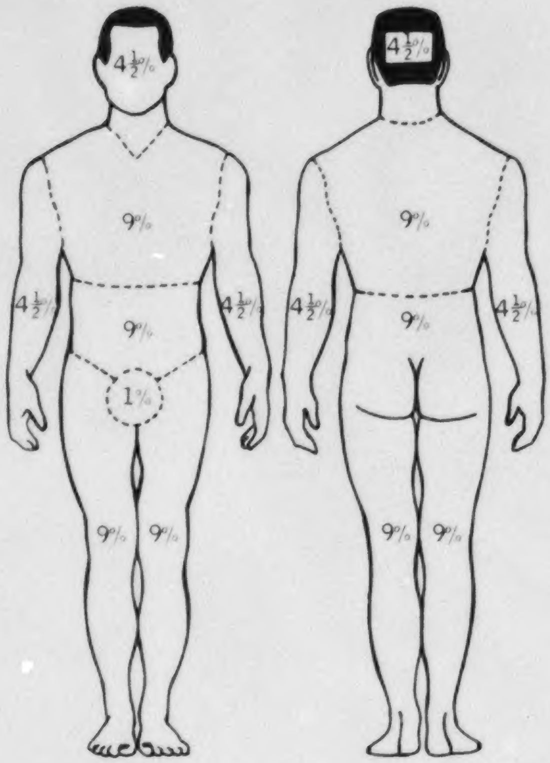

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Figure 7-1.—Rule of Nines.

the depth of the burn. A first degree or second degree burn that covers a very large area of the body is almost always more serious than a small third degree burn. A first degree sunburn, for example, can cause death if a very large area of the body is burned.

The causes of burns are generally typed as thermal (heat), chemical, electrical, or radiation. Whatever the cause of the burn, shock always results if the burns are extensive.

THERMAL BURNS

Thermal burns are caused by exposure to intensely hot solids, liquids or gas. Their care depends upon the severity of the burn and the percentage of the body area involved.

Treatment

Minor burns such as first degree over less than 20% of the body area, and small second degree burns, usually do not require immediate medical treatment. Burns of the face are the exception to this rule. The following are general rules for treating burn victims:

1. Examine for and relieve any respiratory distress. Always anticipate respiratory difficulty when there are burns around the face or if the victim has been exposed to hot gases or smoke, since these may cause the airway to swell shut. Keep the airway open by tilting the chin up and forward, or if necessary, holding the tongue down with a flat object. Place the victim of facial burns in a sitting position, this will further ease his breathing. Transport victims of facial burns to a medical facility as soon as possible for further evaluation.

2. Remove all rings, bracelets, and similar articles, even from unburned areas, since swelling may be severe and develop rapidly.

3. To relieve pain, apply cold damp sheets to the affected area or submerge it in cold water. Cold water not only minimizes pain, but also reduces the burning effect in the deeper layers of skin. Gently pat dry the area with lint-free cloth or gauze. Aspirin is also effective for the relief of pain. Cold packs may be applied.

4. Cover the burned area with a sterile dressing, clean sheet, or unused plastic bag. When the hands and feet are involved, dressings must be applied between the fingers and toes to prevent the skin surfaces from sticking to each other. Coverings such as blankets, or other materials with a rough texture should not be used because lint may contaminate and further irritate the injured tissue.

5. Do not attempt to break blisters, remove shreds of tissue or adhered particles of charred clothing. Never apply a greasy substance (butter, lard, or vaseline), antiseptic preparations or ointments. These may cause further complications and interfere with later treatment by a physician.

6. If the victim is conscious and not vomiting, prepare a weak solution of salt (1 teaspoon) and baking soda (1/2 teaspoon) in a

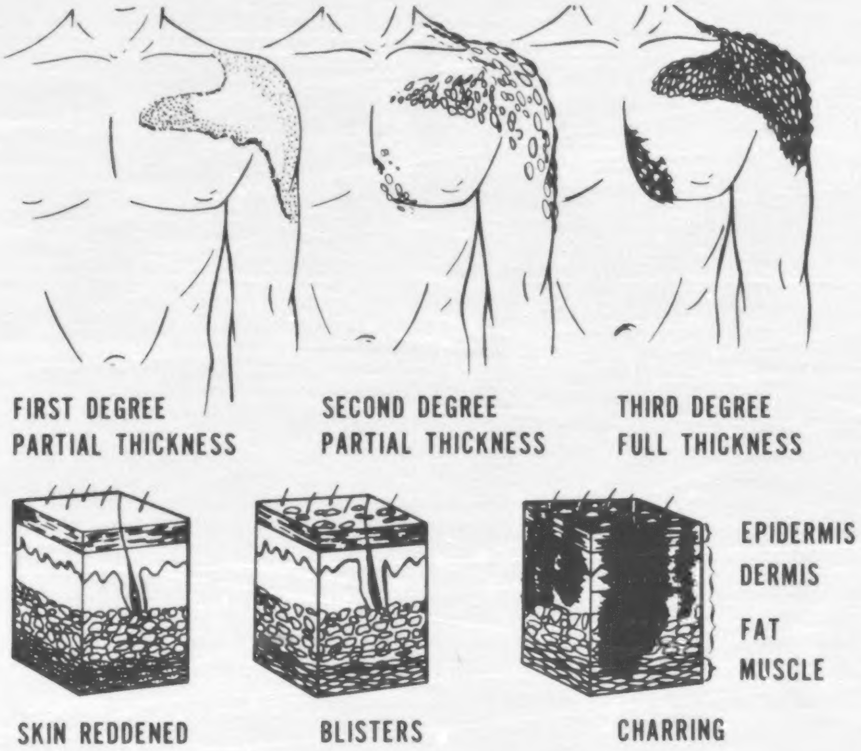

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Figure 7-2.—First, Second, and Third Degree Burns.

quart of warm water. Allow the victim to sip the drink slowly.

7. Treat for shock. Maintain the victim's body heat, but do not allow him to become overheated.

8. If the victim's hands, feet or legs are affected, they should be elevated higher than the heart.

9. If the burn victim is to be transported to a medical facility, try to contact the facility before he arrives to allow time to prepare for immediate treatment. Inform them of the degree of burn, location, and the percentage of body area involved.

CHEMICAL BURNS

When acids, alkalies, or other chemicals come in contact with the skin or other body membranes, they may cause injuries which are generally referred to as chemical burns. For the most part, these injuries are not caused by heat, but by direct chemical destruction of body tissues. Areas most often affected are the extremities, mouth and eyes. Alkali burns are usually more serious than acid burns because alkalies penetrate deeper and burn longer.

When such burns occur on board ship, or in the shop, emergency measures must be carried out immediately, without waiting for the arrival of medical personnel. The following procedures should be followed when treating chemical burns:

1. Begin flushing the area immediately with large amounts of water. Use a shower or hose if available. Do not apply water too forcefully. Continue to flood the area while the clothing,

including shoes and socks, is being removed, and afterwards. NOTE: There are two exceptions to the above. In alkali burns caused by dry lime, the mixing of water and lime creates a very corrosive substance. Dry lime should be brushed from the skin and clothing, unless large amounts of water are available for rapid and complete flushing. In acid burns caused by phenol (carbolic acid), wash the affected area with alcohol because phenol is not water soluble. Then wash with water. If alcohol is not available, flushing with water is better than no treatment at all.

2. After thorough washing, neutralize any chemical which remains on the affected area. WARNING: Do not attempt to neutralize any chemical unless you are sure exactly what it is, and what substance will effectively neutralize it. Further damage may be done by a neutralizing agent that is too strong or incorrect. For acid burns make a solution of one teaspoon of baking soda in a pint of water, and flush it over the affected area. For alkali burns, mix one or two teaspoons of vinegar in a pint of water and flush it over the affected area.

3. Flush the area again with water and gently pat dry with sterile gauze. Do not rub.

4. Transport the victim to a medical facility.

Chemical Burn of the Eye

Flush the eye immediately with large amounts of fresh, clean water. Acid burns should be flushed at least five minutes, and alkali burns for as long as twenty minutes. Because of the intense pain, the victim may be unable to open his eyes. If this occurs, hold the eyelids apart so that water can flow across the eye.

A drinking fountain may be used to supply a steady stream of water. Hold the victim's head in a position that allows water to flow from the inside corner of the eye toward the outside. Do not allow the water to fall directly on the eye, nor use greater force than is necessary to keep the water flowing across the eye.

CAUTION: Never use any chemical antidotes, such as vinegar, baking soda, or alcohol in treating burns of the eye.

After thorough irrigation, loosely cover both eyes with a clean dressing.

The after care for all chemical burns is similar to that for thermal burns; cover the affected area and get the victim to a medical facility as soon as possible.

ELECTRICAL BURNS

Electrical burns are more serious than they first appear. The entrance wound may be small, but as electricity penetrates the skin, it burns a large area below the surface as illustrated in figure 7-3. Usually there are two external burn areas, one where the current enters the body, and another where it leaves.

Before starting first aid, remove the victim from the electrical source. If power equipment is involved, shut it off or disconnect it immediately. If the victim is in an auto accident

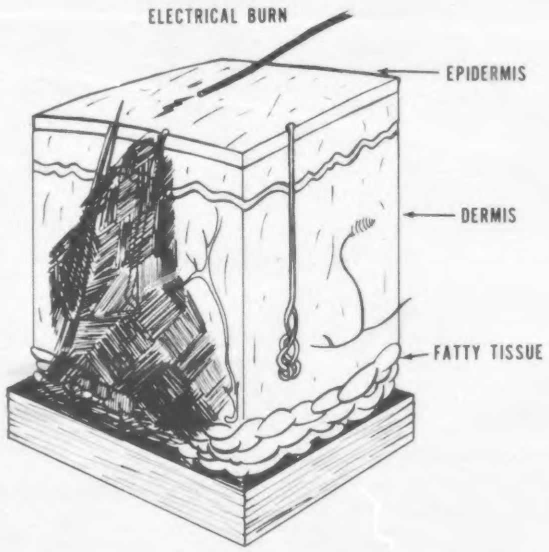

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Figure 7-3.—Electrical Penetration of the Skin.

and a live wire is laying on the car, pull the wire from the car using a non-conducting dry rope or similar object. Stay away from the severed end of the power line because it can jump.

When rescuing a victim who has come into direct contact with a power line, stand on a well-insulated object, and use dry rope or a wooden pole to either push or pull the wire away from the victim, or the victim away from the wire. See figure 7-4. Do not touch the victim until this is done or you too will become a casualty.

Electrical burns are often accompanied by respiratory failure and cardiac arrest which are of more immediate danger to the victim than the burn itself. Start CPR (chapter 2) immediately and continue until the victim regains normal heartbeat and breathing. Then, lightly cover the site of the burn with a dry, preferably sterile dressing, treat for shock, and transport the victim to a medical facility.

RADIATION BURNS

This chapter is only concerned with the treatment of burns caused by solar radiation. The NBC chapter discusses the signs, symptoms, and treatment of radiation injuries caused by a nuclear accident, or war.

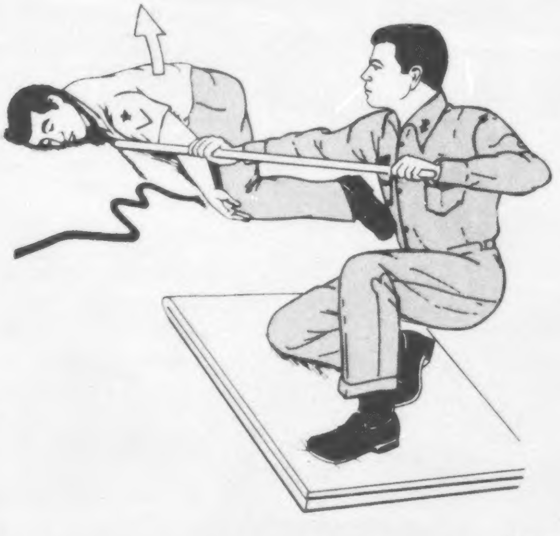

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Figure 7-4.–Pushing a Victim Away From a Power Line.

Sunburn results from a prolonged exposure to the ultraviolet rays of the sun. First and second degree burns may develop. Treatment is essentially the same as that already outlined for thermal burns. If the sunburn is not serious, and the victim will not need medical attention, commercially prepared sunburn lotions and ointments may be applied.

WHITE PHOSPHOROUS BURNS

A special category of burns, which may effect military personnel in either a wartime or training situation, is that caused by exposure to white phosphorous (WP or "Willy Peter"). First aid for this type of burn is complicated by the fact that white phosphorous particles ignite upon contact with air.

Superficial burns caused by simple skin contact or burning clothes can be treated by water flushing and thermal burn first aid. Partially imbedded white phosphorous particles must be continuously flushed with water while the first aider removes them with whatever tools are available (tweezers, needle-nosed pliers, etc.). Do this quickly, but gently. Firmly imbedded, or deeply imbedded particles that cannot be removed by the first aider must be covered with a saline soaked dressing, which must be kept wet until the victim reaches medical personnel. When rescuing victims from a closed space where white phosphorous is burning, protect your lungs with a wet cloth over your nose and mouth.

HEAT EXPOSURE INJURY

Excessive heat affects the body in a variety of ways. When a person exercises in a hot environment, heat builds up inside the body. The body automatically reacts to get rid of this heat through the sweating mechanism. If the body loses large amounts of water and salt from sweating, heat cramps and heat exhaustion are likely to follow. When the body becomes overheated and cannot eliminate the excessive heat, heat stroke (sunstroke) will result.

Heat Cramps

Heat cramps usually affect people who work in hot environments or engage in strenuous exercise. Excessive sweating may result in painful heat cramps in the muscles of the abdomen, legs, and arms. Heat cramps may also result from drinking ice water or other cold drinks either too quickly or in too large a quantity after exercise. Muscle cramps are often an early sign of approaching heat exhaustion.

Treatment

To provide first aid treatment for heat cramps, remove the patient to a cool place. Since heat cramps are caused by loss of salt and water, give the victim plenty of water to drink, adding about 1 teaspoon of salt to a quart of water. Apply manual pressure to the cramped muscle, or gently massage it to relieve the spasm. If there are indications of anything more serious, transport the victim immediately to a medical facility.

Heat Exhaustion

Heat exhaustion (heat prostration or heat collapse) is the most common condition caused by working or exercising in hot environments. In heat exhaustion there is a serious disturbance of blood flow to the brain, heart, and lungs. This causes the victim to experience weakness, dizziness, headache, loss of appetite and nausea. He may faint, but will probably regain consciousness as his head is lowered, improving the blood supply to his brain. Signs and symptoms of heat exhaustion are similar to those of shock; the victim will appear ashen gray, his skin cold, moist, and clammy, and the pupils of his eyes may be dilated (enlarged). The vital signs usually are normal, however, the victim may have a weak pulse together with rapid and shallow breathing. Body temperature may be below normal.

Treatment

Care for the victim as if he were in shock (Chapter 4). Loosen the clothing, apply cool wet cloths, move him to either a cool or air conditioned area, and fan the victim. Do not allow chilling. If the victim is conscious give him a solution of 1 teaspoon of salt dissolved in a quart of cool water. If the victim vomits do not give any more fluids. Transport to a medical facility as soon as possible.

Heat Stroke

Sunstroke is more accurately called heat stroke since it is not necessary to be exposed to the sun for this condition to develop. It is a less common but far more serious condition than heat exhaustion since it carries a 20 percent mortality rate. The most important feature of heat stroke is the extremely high body temperature (105 degrees Fahrenheit, 41°C, or higher) which accompanies it. In heat stroke, the victim has a breakdown of his sweating mechanism and is unable to eliminate excessive body heat built up while he is exercising. If the body temperature rises too high, the brain, kidneys, and liver may be permanently damaged.

Sometimes the victim may have preliminary symptoms such as headache, nausea, dizziness, or weakness. Breathing will be deep and rapid at first, later shallow and almost absent. Usually the victim will be flushed, very dry, and very hot. His pupils will be constricted (pinpoint) and the pulse fast and strong. See figure 7-5. Compare these symptoms with those of heat exhaustion.

Treatment

When providing first aid for heat stroke, remember that this is a true life and death emergency. The longer the victim remains overheated, the more likely he is to suffer irreversible body damage or death. First aid is designed to reduce body heat.

Reduce body heat immediately by dousing the body with cold water, or applying wet, cold towels to the whole body. Remove the victim to the coolest possible place and remove as much clothing as possible. Maintain an open airway (Chapter 2). Place him on his back, with his head and shoulders slightly raised. If cold packs are available, place them under the arms, around

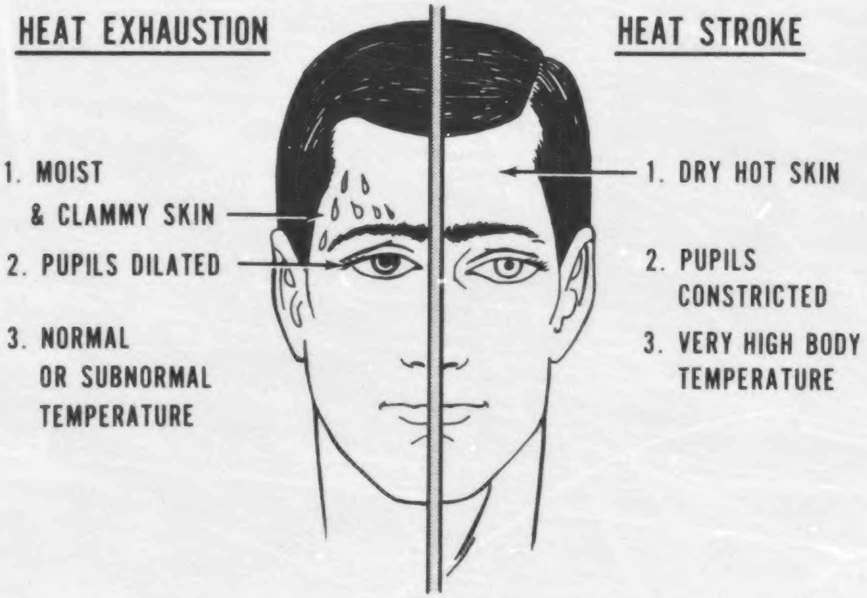

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Figure 7-5.—Symptoms of Heat Stroke and Heat Exhaustion.

the neck, at the ankles, and in the groin. Expose the victim to a fan or air conditioner since drafts will promote cooling. Immersing the victim in a cold water bath is also very effective. If the victim is conscious, give him cool water to drink. Do not give any hot drinks or stimulants.

Get the victim to a medical facility as soon as possible. Cooling measures must be continued while the victim is being transported.

COLD INJURIES

When the body is subjected to severely cold temperatures, blood vessels constrict and body heat is gradually lost. As body temperature drops, tissues are easily damaged or destroyed.

All cold injuries are similar, varying only in degree of tissue injury. The extent of injury depends on such factors as wind speed, temperature, type and duration of exposure, and humidity. Tissue freezing is accelerated by wind, humidity, or a combination of the two. Injury caused by cold, dry air will be less than that caused by cold, moist air, or exposure to cold air while wearing wet clothing. Fatigue, smoking, drugs, alcoholic beverages, emotional stress, dehydration, and the presence of other injuries intensify the harmful effects of cold.

In general, the effects of cold are broken down into two types: general cooling of the entire body, and local cooling of parts of the body. However, cold injuries will seldom be totally of one type.

GENERAL COOLING (HYPOTHERMIA)

General cooling of the entire body is caused by continued exposure to low or rapidly dropping temperatures, cold moisture, snow or ice. Those exposed to low temperatures for extended periods may suffer ill effects even if they are well protected by clothing, because cold affects the body systems slowly, almost without notice. As the body cools, there are several stages of progressive discomfort and disability. The first symptom is shivering, which is an attempt by the body to generate heat. This is followed by a feeling of listlessness, indifference, and drowsiness. Unconsciousness can follow quickly. Shock becomes evident as the victim's eyes assume a glassy stare, respiration becomes slow and shallow, and the pulse weak or absent. As the temperature drops even lower, the extremities freeze. Finally, death results.

Treatment

1. Carefully observe respiratory effort and heartbeat since CPR (Ch. 2) may have to be provided while the rewarming process is underway.
2. Rewarm the victim as soon as possible. It may be necessary, however, to treat other injuries before the victim can be moved to a warmer place. Severe bleeding must be controlled and fractures splinted over clothing before the victim is moved.
3. Replace wet or frozen clothing and anything that constricts the victim's arms, legs, or fingers, interfering with circulation.
4. If the victim is inside a warm place and is conscious, the most effective method of warming him is immersion in a tub of warm water (100° - 105°F, (38° - 41°C) or warm to the elbow–never hot). Observe closely for signs of respiratory failure and cardiac arrest.
5. If a tub is not available, apply external heat to both sides of the victim, using covered hot water bottles, or if possible, body heat from the rescuers (skin to skin). This is called "buddy warming". Since the victim is unable to generate adequate body heat, merely placing him under a blanket or in a sleeping bag is not sufficient. Do not place artificial heat next to bare skin.
6. If the victim is conscious, give warm liquids to drink. Never give alcoholic beverages or allow the victim to smoke.
7. Dry the victim thoroughly if water is used to rewarm him.
8. As soon as possible transfer the victim to a medical facility, keeping him warm enroute. Be alert for the signs of respiratory failure and cardiac arrest during transfer.

LOCAL COOLING

Local cooling injuries, affecting parts of the body, fall into two categories, freezing and non-freezing. In order of increasing seriousness, they include chilblain, immersion foot, superficial frostbite, and deep frostbite. The areas most commonly affected are the face and extremities.

Chilblains

Chilblains are a mild cold injury caused by prolonged and repeated exposure for several hours to air temperatures from above freezing (32°F/0°C) to as high as 60°F (16°C). Chilblains are characterized by redness, swelling, tingling and pain of the skin area. Injuries of this nature require no specific treatment except to warm the affected part, keep it dry, and prevent further exposure.

Immersion Foot

Immersion foot, which also may occur in the hands, results from prolonged exposure to wet cold at temperatures ranging from just above freezing (32°F/0°C) to 50°F (10°C), and usually in connection with limited motion of the extremities and water soaked protective clothing.

Signs and symptoms of immersion foot are tingling and numbness of the affected areas; swelling of the legs, feet, or hands; bluish discoloration of the skin; blisters and pain. Gangrene may occur.

Treatment

1. Get the victim off his feet as soon as possible.

2. Remove wet shoes, socks and gloves to improve circulation.

3. Expose the affected area to warm dry air.

4. Keep the victim warm.

5. Do not rupture blisters or apply salves and ointments.

6. If the skin is not broken or loose, the injured part may be left exposed; however, if it is necessary to transport the victim, the injured area should be covered with loosely wrapped fluff bandages of sterile gauze.

7. If the skin is broken, place a sterile sheet under the extremity and gently wrap to protect the sensitive tissue from pressure and additional injury.

8. Transport to a medical facility as soon as possible.

Frostbite

Frostbite occurs when ice crystals form in the skin or deeper tissues after exposure to a temperature of 32°F (0°C) or lower. Depending upon the temperature, altitude, and wind speed, the exposure time necessary to produce frostbite varies from a few minutes to several hours. The areas commonly affected are the face and extremities.

The symptoms of frostbite are progressive. Victims generally incur this injury without being acutely aware of it. Initially, the affected skin reddens and there is an uncomfortable coldness. With continued heat loss, there is a numbness of the affected area due to reduced circulation. As ice crystals form, the frozen extremity appears white, yellow-white, or mottled blue-white, and is cold, hard, and insensitive to the touch or pressure.

Frostbite is classified as superficial or deep, depending on the extent of tissue involvement.

Superficial Frostbite

In superficial frostbite, the surface of the skin will feel hard, but the underlying tissue will be soft, allowing it to move over bony ridges. This is evidence that only the skin and the region just below it are involved.

Treatment

1. Bring the victim indoors.

2. Hands can be rewarmed by placing them under the armpit, against the abdomen or between the legs.

3. Feet can be warmed by placing in the armpit or against the abdomen of a buddy.

4. Gradually rewarm the affected area by warm water immersion, skin to skin contact, or covered hot water bottles.

5. Never rub a frostbite area.

Deep Frostbite

In deep frostbite, the freezing reaches into the deep tissue layers. There are ice crystals in the entire thickness of the extremity. The skin will not move over bony ridges and feels hard and solid.

The objectives of treatment are to protect the frozen area from further injury, to rapidly thaw the affected area, and to be prepared to respond to circulatory or respiratory difficulties.

1. Carefully assess and treat any other injuries first. Constantly monitor the victim's pulse and breathing since respiratory and heart problems can develop rapidly. Be ready to administer CPR.

2. Make no attempt to thaw the frostbitten area if there is a possibility of refreezing. It is better to leave the part frozen until the victim arrives at a medical facility equipped for long term care. Refreezing of a thawed extremity causes severe and disabling damage.

3. Treat all victims with injuries to feet or legs as litter cases. When this is not possible, it has been proven that walking will not lessen the chances of successful treatment as long as the limb has not been thawed out.

4. When adequate protection from further cold exposure is available, prepare the victim for rewarming by removing all constricting items of clothing such as gloves, boots, and socks. Boots and clothing frozen on the body should be thawed by immersing them in warm water before removal.

5. Rapidly rewarm frozen areas by immersion in water at 100°F (38°C) to 105°F (41°C). Keep the water warm by adding fresh hot water, but do not pour it directly on the injured area. Ensure that the frozen area is completely surrounded by water; do not let it rest on the side or bottom of the tub.

6. After rewarming has been completed, pat dry the area with a soft towel. At first the

injured area will feel numb and look mottled blue or purple. Later it will swell, sting and burn. Blisters may develop. These should be protected from breaking. Avoid pressure, rubbing, or constriction of the injured area. Keep the skin dry with sterile dressings, and place cotton between the toes and fingers to avoid their sticking together.

7. Protect the tissues from additional injury and keep as clean as possible (sterile dressings and linen should be used).

8. The general morale and comfort of the victim might improve by hot, stimulating fluids, such as tea or coffee. Do not allow the victim to smoke or use alcoholic beverages while being treated at the first aid level.

9. Transfer the victim to a medical facility as soon as possible. During transportation, slightly elevate the frostbitten area and keep the victim and the injured area warm. Do not allow the injured area to be exposed to the cold.

CHAPTER 8

DRUG ABUSE AND POISONING

DRUGS

A drug is any substance which produces an effect on the mind or body. Undesirable reactions can occur with the use of any drug. Harmful reactions result when a person accidentally or intentionally MISUSES any of the following:

1. Alcohol
2. Prescription drugs
3. Non-prescription drugs ("over the counter medicine")
4. Illegal drugs ("street" drugs)
5. Household or industrial chemicals

Most drugs which are knowingly misused are taken for their stimulating, depressing or hallucinatory effect on the mind. Often the physical effects of these drugs are extremely unpleasant and even life threatening.

Stimulants

Stimulants, also called "UPPERS," include the amphetamines, cocaine, some antiasthmatics and antihistamines. Characteristic symptoms include excitement, restlessness, irritability and talkativeness. If the person is unconscious, check for cardiorespiratory failure. Respiratory failure is common among cocaine abusers.

Depressants

Depressants, also called "DOWNERS," include narcotics, sleeping pills, tranquilizers and alcohol. Characteristic symptoms include depression, sleepiness, poor reflexes and "driftiness". Since all these agents depress respiration, care must be taken to insure an open airway and watch closely for respiratory failure. Often respiratory failure is not recognized because it is assumed that the victim just "fell asleep".

When considering alcohol as a depressant drug, it must be emphasized that many other medical problems present symptoms that look like alcohol intoxication (drunkenness), therefore do not assume that the person is "just drunk and will sleep it off". Occasionally a person may drink enough alcohol to develop a severe physiological depression with breathing problems. Another problem associated with alcohol intake occurs as a result of withdrawal from it. These people often suffer uncontrollable shaking and hallucinations (also called DT's) which may develop into convulsions/seizures (fits). A person in DT's must be protected from doing harm to himself or others.

Closely related to alcohol intoxication are the symptoms persons experience following the inhalation (sniffing) of certain chemical products such as glue and gasoline. Glue sniffing can quickly lead to loss of consciousness, breathing problems and death.

Hallucinogens

Hallucinogens are drugs that affect how a person mentally sees himself, others and his surroundings. These drugs (LSD, STP, Mescaline) can cause emotional symptoms that range from ecstasy to horror ("bad trip").

Another problem that occurs with using hallucinogens is called "flashback". Flashback can occur anytime after the drug has been used. These episodes mimic and may intensify the original drug experience. Persons experiencing hallucinogen drug symptoms often display behavior that is dangerous to themselves and others.

HANDLING DRUG ABUSE VICTIMS

As with all emergency victims, priorities of care must be set. Situations involving breathing or heart failure must receive immediate attention. First aid should be administered in the following order:

1. Insure adequate breathing and heart function. (Cardiopulmonary resuscitation–CPR).

2. Treat for shock if necessary.

3. Keep victim awake by using cold wet towels, gentle shaking, walking and conversation.

4. Attempt to make victim vomit if conscious. If victim is semiconscious or unconscious no attempt should be made to cause vomiting.

5. Semiconscious or unconscious victims should be positioned on their side so that materials in the mouth can drain out instead of into the lungs.

6. Victims who have taken drugs which cause severe excitement and/or hallucinations should be handled in such a way to protect them from self injury. Use physical restraints only when absolutely necessary.

7. Attempts should be made to calm the excited and/or hallucinating victim by "talking him down" with quiet reassuring conversation.

8. If victim is bleeding or appears to have a bone injury administer the appropriate basic first aid (see chapters 3 and 4).

9. Collect all materials (empty bottles, packages, vomitus, etc.) and information available at the scene to assist medical personnel in identifying abused drug and treating the victim.

10. Get the victim to medical assistance as soon as possible.

11. Brief medical personnel on all information and materials collected concerning the incident.

POISONS

Each year in the United States there are thousands of deaths from suicidal or accidental poisonings. In addition to the fatalities, approximately 1 million cases of nonfatal poisonings occur because of exposure to substances in everyday use such as medicines, industrial chemicals, cleaning agents, and plant and insect sprays.

The United States Public Health Service maintains a clearinghouse for information about all types of poisons. It also identifies the poisonous ingredients in all kinds of commercial products. This information is exchanged with Poison Control Centers at medical facilities throughout the country.

Most poisons act rapidly, requiring immediate emergency first aid. Treatment by a physician or assistance from a Poison Control Center should also be obtained immediately. If more than one person is present, one should obtain assistance while the other begins administering aid to the victim. Although the symptoms of poisoning may disappear completely before professional help is obtained, the poison may have harmful or fatal after-effects.

A poison can be in a solid, liquid, or gaseous state. Poisoning should be suspected whenever a sudden unexplained illness develops. The immediate area should be searched for evidence of the cause. Clues such as gases or other chemical odors may be present. Leftover food, drinking glasses, containers, or bottles may also provide clues.

Poisons can be ingested (swallowed), inhaled, absorbed, or injected into the body. The routes of entry, together with the types of poison, cause different symptoms and require different methods of treatment.

INGESTED

Identifying ingested poisons is difficult because different poisons often share common symptoms. Sudden nausea, vomiting, abdominal cramps, or diarrhea are symptoms of many poisons.

Noncorrosives

This is a large and varied group of substances which have the common characteristic of irritating the stomach when swallowed. They produce nausea, vomiting, convulsions, and severe abdominal pain. The victim may complain of a strange taste and his lips, tongue and mouth may look different than normal. Shock occurs in severe cases. A group of noncorrosives is listed in table 8-1.

Treatment

Do not waste time looking for antidotes. The preparation called the "Universal Antidote" is no longer used because its ingredients inactivate each other. When treating a victim of a noncorrosive poison:

1. Maintain an open airway–give artificial ventilation as necessary.
2. Dilute the poison by having the victim drink a glass or two of water or milk. CAUTION: Do not give liquids to an unconscious or convulsing victim!
3. Try to make the victim vomit after diluting the poison. CAUTION: Do not try to make an unconscious or convulsing victim vomit. He may choke on the vomited material.
    a. To induce vomiting, give 1 tablespoon of syrup of ipecac followed by a glass or two of water, milk, or fruit juice.
    b. If the victim does not vomit within 20 minutes, repeat the ipecac, one time only.
    c. If ipecac is unavailable, induce vomiting by tickling the back of the victim's throat with a finger.

Table 8-1.–Common Stomach Irritants and Possible Sources of Contact

Irritant	Source of contact
Arsenic	Dyes, insecticides, paint, printer's ink, wood preservative
Copper	Antifoulant paint, batteries, canvas, preservative, copper plating, electroplating, fungicides, insecticides, soldering, wood preservative
Iodine	Antiseptics
Mercury	Bactericides, batteries, dental supplies and appliances, disinfectants, dyes, fungicides, ink, insecticides, laboratories, photography, wood preservative
Phosphorus	Incendiaries, matches, pesticides, rat poison
Silver nitrate	Batteries, cleaning solutions, ink, photographic film, silver polish, soldering
Zinc	Disinfectants, electroplating, fungicides, galvanizing, ink, insecticides, matches, metal plating and cutting, paint, soldering, wood preservative

d. Keep the victim's head as low as possible to help induce vomiting, and prevent the victim from choking.

4. Collect the vomitus to take to the hospital along with the suspected poison container to:

a. aid in identifying the poison

b. provide an estimate of the amount of poison ingested.

5. Transport the victim, vomitus, and container to a medical facility.

a. If transportation is not immediately available, an absorbent or soothing agent may be given after the victim has vomited. Check with medical personnel first, if possible.

b. Activated charcoal is very effective in absorbing poisons. Mix 1 or 2 tablespoons in a glass of warm water immediately before giving it to the victim.

c. Milk or milk of magnesia are very effective soothing agents for the irritated stomach.

Corrosives

Acids, phenols, and alkalies produce actual burning and corrosion of the tissues of the lips, mouth, throat, and stomach. Stains around the mouth and the presence of characteristic odor provide further clues. Swallowing and breathing are difficult and the abdomen may be tender and swollen with gas. Examples of corrosive agents and sources of contact are listed in table 8-2.

Treatment

DO NOT INDUCE VOMITING! The same corrosive materials that burned the lips and throat when swallowed will cause further tissue damage when they are vomited. First aid consists of neutralizing the poison and keeping alert for shock.

1. Neutralize acids and phenols by administering milk of magnesia, aluminum hydroxide gel or 2 glasses of milk.

Table 8-2.—Examples of Common Acids, Alkalies, and Phenols With Possible Sources of Contact

AGENT	SOURCES OF CONTACT
ACIDS	
Hydrochloric	Electroplating, metal cleaners, photoengraving
Nitric	Industrial cleaners, laboratories, photoengraving, rocket fuels
Oxalic	Cleaning solutions, paint and rust removers, photo developer
Sulphuric	Auto batteries, detergents, dyes, laboratories, metal cleaners
ALKALIES	
Ammonia	Galvanizers, household cleaners, laboratories, pesticides, rocket fuels
Lime	Brick masonry, cement, electroplating, insecticides, soap, water treatment
Lye	Bleaches, degreasers, detergents, laboratories, paint and varnish removers
PHENOLS	
Carbolic	Disinfectants, dry batteries, paint removers, photo materials, wood preservers
Creosole	Disinfectants, ink, paint, and varnish removers, photo developer, stainers
Creosote	Asbestos, carpentry, diesel engines, electrical shops, furnaces, lens grinders, painters, water proofing, wood preservers

2. Neutralize alkalies with lemon or orange juice, or a mixture of equal parts of vinegar and water.

3. After neutralizing the poison, give milk, raw eggs in milk, salad oil, flour in water, or other bland foods.

4. Transport to a medical facility.

5. Continually observe for shock.

a. If shock occurs, treat it as previously explained.

b. Keep the airway open, and anticipate vomiting and convulsions.

Petroleum Products

Kerosene, gasoline, turpentine, and related petroleum products will usually cause severe chemical pneumonia as well as other toxic effects in the body. Symptoms include abdominal pain, choking, gasping, vomiting, and fever. Often these products may be identified by their characteristic odor.

Treatment

DO NOT INDUCE VOMITING unless told to do so by a physician or poison control center. Vomiting may cause additional poison to enter the lungs; however, the quantity of poison swallowed, or special petroleum additives may make vomiting desirable.

1. If a physician or poison control center cannot be reached, give the victim 4 ounces of mineral oil, or 2 glasses of milk or water.

2. Transport to a medical facility immediately.

Shellfish and Fish Poisoning

Mussels, clams, oysters, and other shellfish, while unpredictable, are more often poisonous during the warm months of March to November. There are numerous varieties of shellfish that should not be eaten at all, so wherever you serve in the world, learn which seafood is known to be safe.

Most fish poisoning occurs with fish which are normally considered safe to eat, but which become poisonous at different times of the year, or from eating poisonous algae and plankton (red tide) that appear in certain locations. Examples of fish which are always poisonous are shown in figure 8-1.

The symptoms of shellfish and fish poisoning are:

1. Tingling and numbness of the face and mouth
2. Muscular weakness
3. Nausea and vomiting
4. Increased salivation
5. Difficulty swallowing
6. Respiratory failure

Treatment

If the victim has not vomited, cause him to do so. If he develops respiratory failure, give artificial ventilation, and treat for shock.

INHALED

In the Navy, many industrial processes are carried out. The problem of poisoning by inhalation is widespread. The irritants and corrosives mentioned in tables 8-1 and 8-2 are more often a source of poisoning by means of inhalation rather than ingestion. The handling of large quantities of petroleum products–fuel, oil, and gasoline, in particular–constitutes special hazard, since all of these products give off poisonous vapors.

Other poisonous gases are by-products of certain operations or processes–exhaust gases from internal combustion engines; fumes or vapors from materials used in casting, molding, welding, plating; gases associated with bacterial decomposition in closed spaces; and gases which accumulate in voids, double bottoms, empty fuel tanks, and similar places. Carbon monoxide is the most common agent of gas poisoning. It is

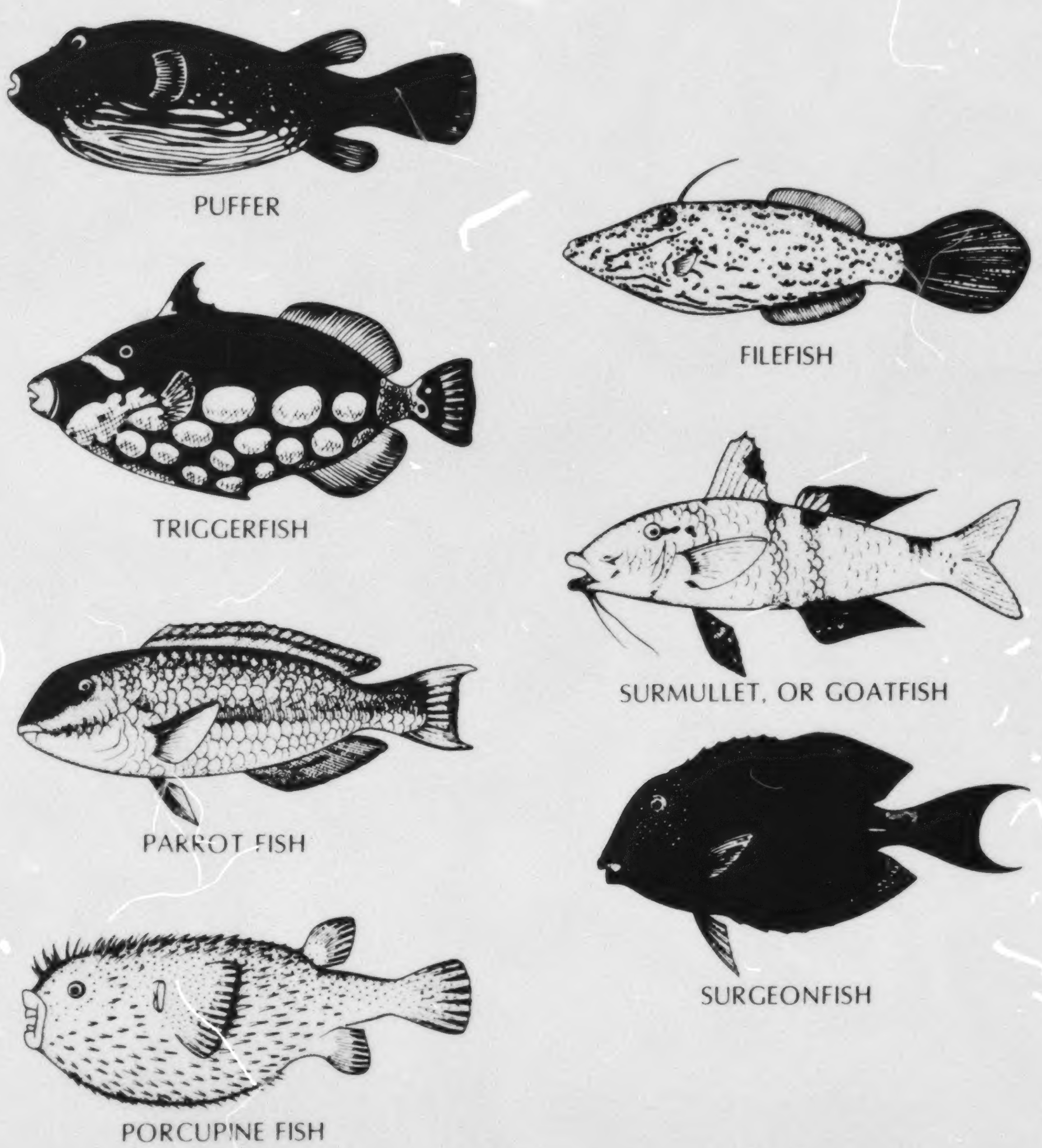
PUFFER
FILEFISH
TRIGGERFISH
SURMULLET, OR GOATFISH
PARROT FISH
SURGEONFISH
PORCUPINE FISH

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Figure 8-1.—Poisonous Fish.

present in all exhaust gases of internal-combustion engines; in sewer gas, lanterns, charcoal grills, and in manufactured gas used for heating and cooking. It gives no warning of its presence since it is completely odorless and tasteless. The victim may lose consciousness and suffer respiratory distress with no warning other than slight dizziness, weakness, and headache. The lips and skin of a victim of carbon monoxide poisoning are characteristically cherry red. Death may occur within a few minutes. Further sources of chemical poisoning are listed in table 8-3.

Inhalation poisoning causes shortness of breath and coughing. This will cause the victim's skin to turn blue. If the respiratory problems are not corrected, cardiac arrest may follow.

Treatment

Remove the victim from the toxic atmosphere immediately. WARNING: Never try to remove a victim from the toxic environment if you do not have the proper protective mask or oxygen breathing apparatus, and are trained in its use. Too often, well intentioned rescuers become victims. When in doubt, call the rescue service. If help is not immediately available and if you know you can reach the victim and rescue him, take a deep breath, hold it, enter, and pull the victim out.

1. If the victim is not breathing, start artificial ventilation.
2. Give oxygen (if it is available).
3. Remove contaminated clothing if chemical warfare agent was cause.
4. Keep the victim quiet and treat for shock.
5. Call for medical assistance immediately.

ABSORBED

Some substances may cause tissue irritation or destruction by contact with the skin, eyes, and lining of the nose, mouth and throat. These

Table 8-3.—Sources of Inhalation Poisoning

Inhalant	Source of contact
Carbon dioxide	Wells and sewers
Carbon monoxide	Fires, lighting, heating and fuel exhausts
Carbon tetrachloride trichlorethylene	Solvents in drycleaning fluid, electrical equipment cleaners, degreasing agents, and fire extinguishers
Chemical warfare agents	Tear, nerve, blister, and vomiting gases; screening smokes; thermite and magnesium incendiary substances; hydrocyanic acid and other systemic poisons
Chlorine	Water purification
Ether, chloroform, nitrous oxide, and cyclopropane	Anesthetic gases
Freon, ammonia, and sulfur dioxide	Ice making and refrigeration units

substances include acids, alkalies, phenols, and some chemical warfare agents. Direct contact with these agents will cause inflammation or chemical burns in the affected areas. Consult the chemical burns (chapter 7) and chemical agent section (chapter 10) for treatment.

INJECTION

Injection of venom by stings and bites from various insects, while not normally life-threatening, can cause an acute allergic reaction which can be fatal. Poisons may also be injected by snakes and marine animals.

Bees, Wasps, and Ants

Stings from bees, wasps, and ants account for more poisonings than any other insect group. Fortunately, their stings rarely result in death. The vast majority of stings cause a minor local reaction of pain, redness, itching, and swelling at the injection site. These symptoms usually fade after a short time.

Approximately 5 percent of the stings and bites cause severe or allergic reactions such as itching, swelling, weakness, headache, difficulty in breathing, and abdominal cramps. Shock may follow quickly and death may occur.

Spiders and Scorpions

Spiders in the United States are generally harmless, with several exceptions. The most notable are the Black Widow and Brown Recluse spiders. Their bites are serious but rarely fatal.

The Black Widow is easily identified by the hourglass-shaped red spot on its belly; see figure 8-2. The bite causes immediate pain which spreads quickly from the region of the bite to the muscles of the back, shoulders, chest, abdomen, and limbs. The pain is usually accompanied by severe spasms of the abdominal muscles. Nausea, vomiting, sweating and difficulty in breathing are frequently present. The Brown Recluse spider is identified by the violin marking on its back (fig. 8-2).

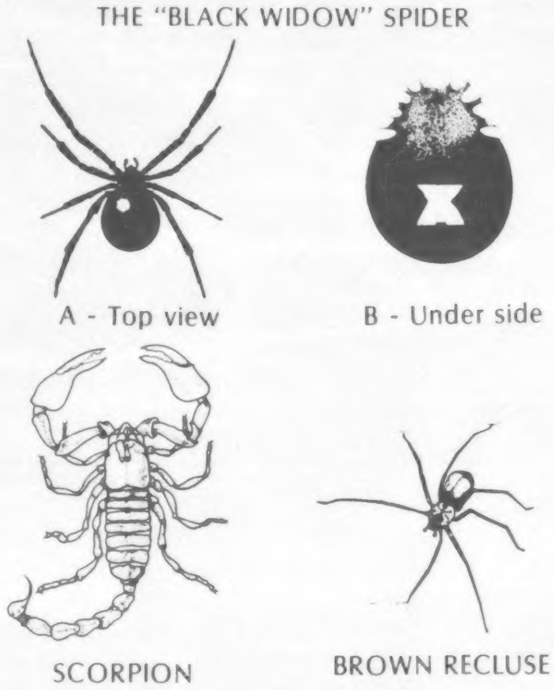

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Figure 8-2.—Black Widow and Brown Recluse Spiders and a Scorpion.

With the exception of a variety found in the Southwest, scorpion stings in the United States are not usually serious. Most scorpion stings produce a burning sensation at the site of the bite followed by pain that spreads to the entire limb. Skin discoloration may be present. Stings from the more dangerous species (Southwestern United States (Arizona), Africa, Asia, and Brazil) produce nausea, vomiting, convulsions, abdominal pain, excessive salivation, and shock. The victim may develop respiratory failure, heart failure, coma, and die.

Treatment (Minor Reaction)

Emergency care for bites and stings depends upon the individual's reaction.

If stung by a honey bee, remove the stinger immediately by scraping it off gently with a sharp object, such as a knife blade, the side of tweezers, or the fingernail. Do not try to grasp the sac or stinger since this simply forces the remaining venom into the skin.

1. Clean the wound and surrounding area.
2. Apply cold packs to slow absorption of the poison and relieve pain.

Treatment (Major Reactions)

Start basic life support immediately (ch. 2). In addition, take the following supportive measures.

1. Make the victim lie down, and refrain from moving about.
2. Immobilize the injured area immediately.
3. If an extremity is involved, remove all rings, bracelets, and watches.
4. If possible apply a constricting band above injured site at the edge of the swelling. Do not apply the band so tightly that it produces a throbbing sensation. The band should be loose enough to slip an index finger under it when it is in place, yet tight enough to stop the flow of blood in the veins but not in the arteries. See figure 8-3. The victim's pulse below the constricting band should be countable.
5. Keep the affected part down, below the level of the victim's heart.
6. Apply cold cloths or ice wrapped in a towel or plastic bag to decrease absorption and relieve pain.
7. If possible, identify the type of spider inflicting the bite, so that appropriate antivenom may be administered at the hospital.
8. Transport the victim to a medical facility immediately, continuing supportive measures enroute.

BITES

SNAKE

Poisonous snakes are found throughout the world, primarily in the tropics and temperate regions. Within the United States there are four kinds: rattlesnakes, copperheads, moccasins, and coral snakes.

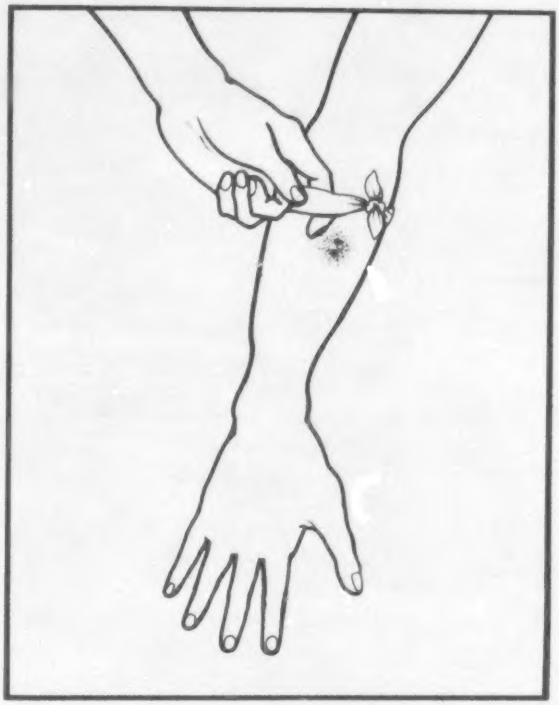

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Figure 8-3.—Constricting Band Properly Applied.

Poison is injected from the venom sacs through grooved or hollow fangs which, depending on the species are either long or short. Pit vipers (rattlesnakes, moccasins, and copperheads) have long hollow fangs folded against the roof of their mouth when not in use, but which extend when striking. This allows them to strike quickly and then withdraw. See figure 8-4.

Short, grooved fangs are found in sea snakes, cobras, kraits, mambas and coral snakes. These snakes are less effective in their attempts to bite since they must chew after striking to introduce enough poison to be effective.

The venoms of different snakes cause different effects. Pit viper venom destroys the

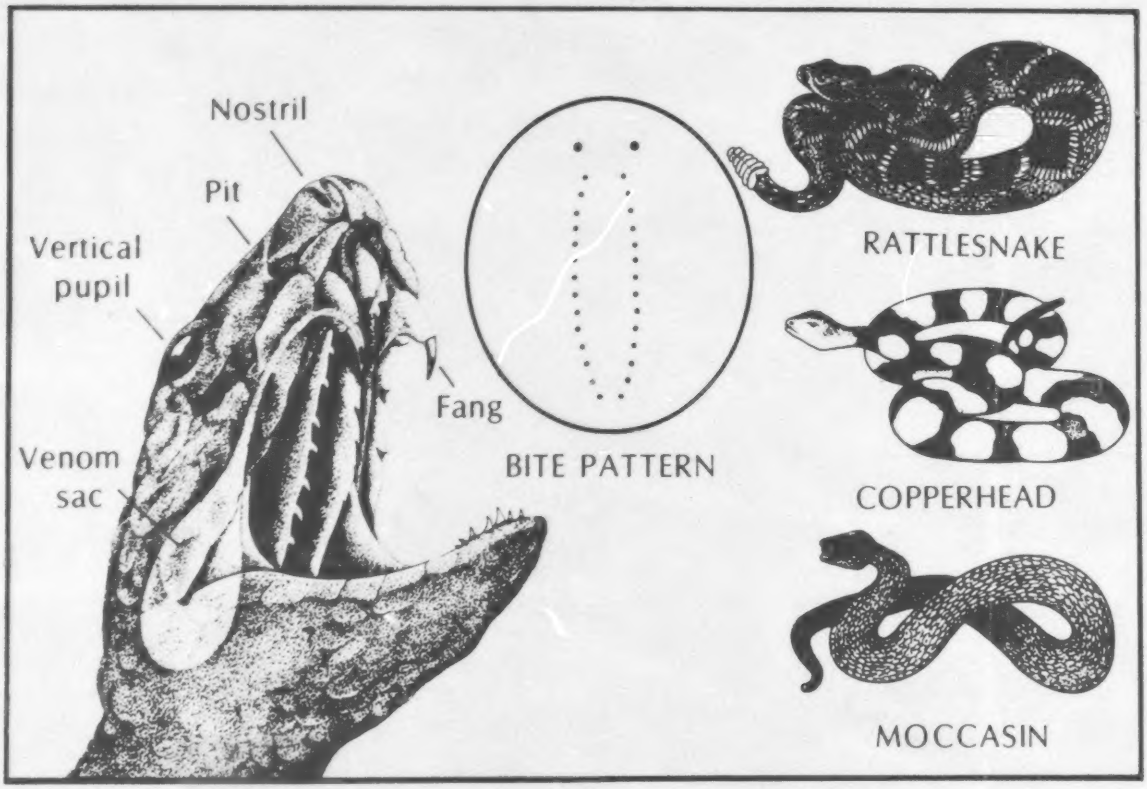

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Figure 8-4.—Pit Vipers Found in The U.S. and Their Bite Pattern.

tissues into which they are injected, and destroys blood cells (hemotoxins). On the other hand, the cobra, adder, and coral snakes inject powerful venoms which affect the central nervous system (neurotoxins) causing respiratory paralysis. Sea snakes have venom that is both hemotoxic and neurotoxic.

The identification of poisonous snakes is imperative since the antivenom and course of treatment will be different for each type of venom. Ideally, the snake should be killed and saved. When this is not done, the identification may be difficult since many venomous snakes resemble harmless varieties. When dealing with snakebite problems in foreign countries, seek native advice, professional or otherwise.

Pit Vipers

The rattlesnakes, copperheads, and moccasins (cottonmouths) are called pit vipers because of the small, deep pits between the nostrils and eyes on each side of the head. In addition to the fangs mentioned earlier, these snakes have other identifying features including thick bodies, slit-like pupils of the eyes, and flat, almost triangular-shaped heads (fig. 8-4). Color markings and other identifying characteristics such as rattles or a noticeable white interior of the mouth (cottonmouth) also help distinguish these poisonous snakes. Further identification is provided by examining the bite pattern of the wound for signs of fang entry (fig. 8-4). Occasionally, there will be only one fang mark, as in the case of a bite on a finger or toe where there is no room for both fangs, or the snake may have broken a fang off.

The victim's condition provides the best information as to the seriousness of the situation. The bite of the pit viper is extremely painful and is characterized by immediate swelling about the fang marks, usually within 5 to 10 minutes. If only minimal swelling occurs within 30 minutes, the bite will almost certainly have been from a nonpoisonous snake, or possibly from a poisonous snake which did not inject venom. When the venom is absorbed, there is general discoloration of the skin due to destruction of blood cells. This reaction is followed by blisters, and numbness in the affected area. Other signs which can occur are weakness, rapid pulse, nausea, shortness of breath, vomiting, and shock.

Treatment for Hematoxic (Blood Poison) Snakebite

In treating snakebites, the aim is to reduce circulation of blood through the bite area, delay absorption of venom, prevent aggravation of the local wound, maintain vital signs, and transport as soon as possible to medical personnel. First aid in most instances will be mainly supportive.

1. Wrap a constricting band (rubber tubing, belt, necktie, stocking, etc.) 2 - 4 inches above the fang marks. It should be tight enough to stop the flow of blood in the veins but not tight enough to shut off the arterial blood supply. The victim's pulse below the band should be countable. If swelling should get beyond the band, put another one just above it and remove the first.

2. Check the pulse and respirations frequently. Give artificial ventilation if necessary.

3. Calm and reassure the victim, who will often be excited or hysterical. Keep the victim lying down, quiet, and warm. He should not be given alcohol or any other stimulant to drink.

4. Treat for shock.

5. Use a splint to immobilize the victim's affected extremity, keeping the involved area below the level of his heart.

6. Cleanse the bite with soap and water or an antiseptic solution.

7. Flush the area well with water.

8. Apply an ice bag or chemical coolant bag, IF A PHYSICIAN SO DIRECTS. Under no circumstances should the extremity be packed in ice!

9. Telephone ahead to the nearest medical help so that the proper antivenom can be made available. Administration of antivenom is not a first aid procedure. It requires preliminary testing of the victim for sensitivity to horse serum. Only a person with medical training should attempt to give the antivenom.

10. Transport immediately.

If the victim is reached within 20 to 30 minutes of the time he was bitten, if he already shows definite signs of poisoning, and if a physician concurs, a sterile knife blade may be used to make an incision about one-half inch long by one-fourth inch deep lengthwise over each fang mark. Suction cups should be applied to help remove some of the injected venom. Suction by mouth is not recommended because the human mouth contains so many different bacteria that the bite could become infected. Incision and suction later than 30 minutes from the time of the bite is not recommended.

Corals, Cobras, Kraits, and Mambas

Corals, cobras, kraits, and mambas all belong to the same group even though they are found in different parts of the world. All four inject their venom through short grooved fangs, leaving the characteristic bite pattern illustrated in figure 8-5.

The small coral snake, found in Southeastern United States is brightly colored with bands of red, black, and yellow (or almost white). Other

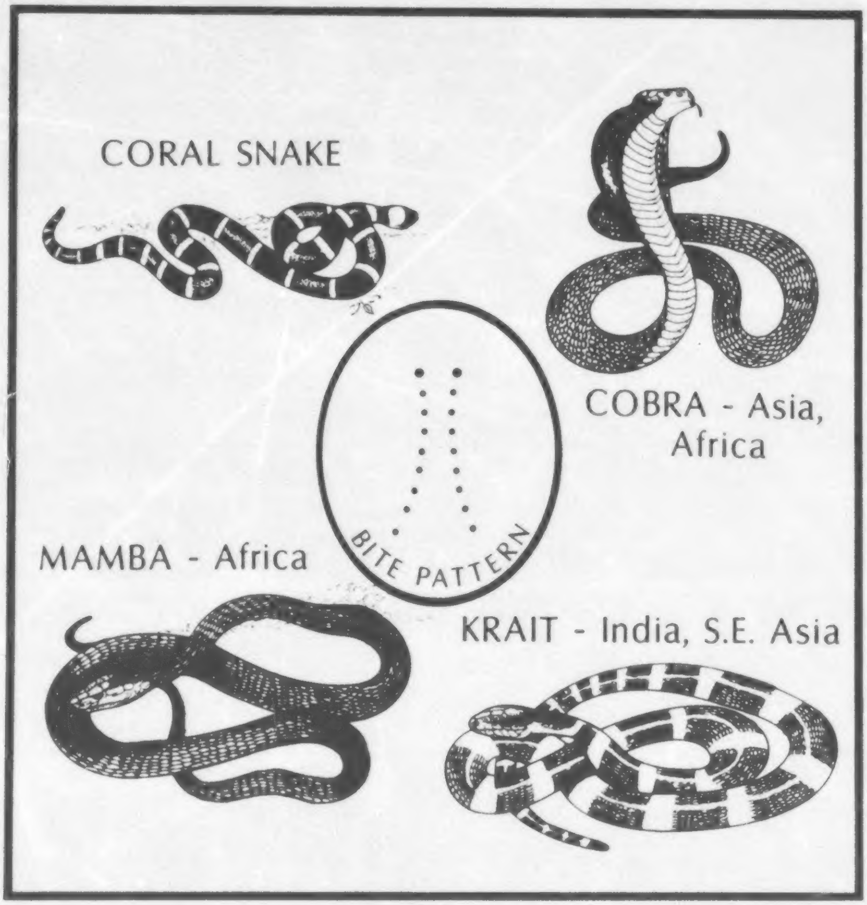

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Figure 8-5.—Neurotoxic Snakes and Their Bite Pattern.

nonpoisonous snakes have the same coloring, but in the coral snake the red ring always touches the yellow ring.

The venom of corals, cobras, kraits, and mambas produces symptoms different than that of the pit vipers. Because there is only minimal pain and swelling many people are led to believe that the bite is not serious. Delayed reactions in the nervous system normally occur after 1 to 7 hours. These symptoms include blurred vision, drooping eyelids, slurred speech, drowsiness, and increased salivation and sweating. Nausea and vomiting, shock, respiratory difficulty, paralysis, convulsions, and coma will probably develop if the bite is not treated promptly.

Treatment for Neurotoxic (Nerve Poison) Snakebite

Due to the delayed reaction of the venom, all bites should receive prompt attention regardless of the victim's seemingly favorable condition. Identify the snake, if possible, so that the proper antivenom treatment may be started at the hospital. Emergency care is the same as that for hemotoxic snakebite with the exception that incision and suction are not recommended since there is little local effect from the bite. The danger is to the nervous system.

SEA ANIMALS

A number of sea animals are capable of inflicting very painful wounds by biting, stinging, or puncturing. Except under rare circumstances, stings and puncture wounds are not fatal. Major wounds from sharks, barracuda, moray eels, and alligators can be treated by controlling the bleeding, preventing shock, giving basic life support, splinting the injury, and securing prompt medical aid. Minor injuries inflicted by turtles, and stinging corals require only that the wound be thoroughly cleansed and the injury splinted. Other sea animals inflict injury by means of stinging cells located in tentacles. This group includes the jellyfish, Portuguese man-of-war (fig. 8-6), anemones, corals, and hydras. Contact with the tentacles produces burning pain, a rash with small hemorrhages in the skin, and, on occasion, shock, muscular cramping, nausea, vomiting, and respiratory distress. Treatment consists of gently removing the clinging tentacles with a towel, and washing the area thoroughly with diluted ammonia or rubbing alcohol. If symptoms become severe seek medical aid.

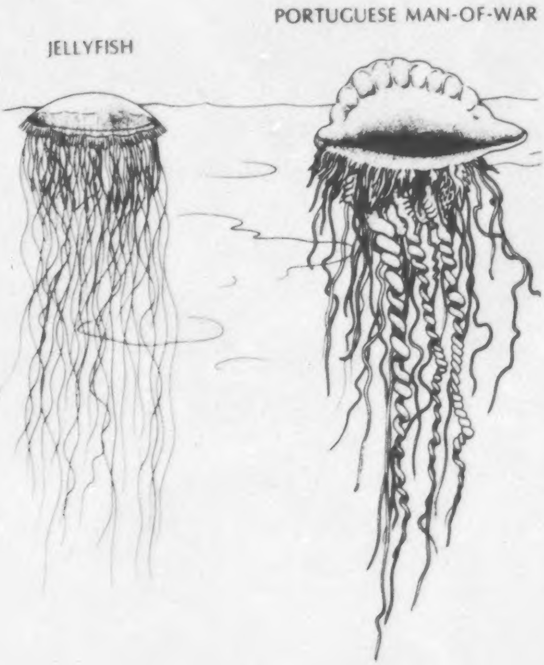

Figure 8-6.–Stinging Sea Animals.

Spiny fish, stingrays, urchins, and cone shells inject their venom by puncturing with spines (figure 8-7). General signs and symptoms include swelling, nausea, vomiting, generalized cramps, diarrhea, muscular paralysis, and shock. Deaths are rare.

Emergency care consists of soaking the wounds in hot water for 30 to 60 minutes, controlling the bleeding, applying a dressing, and obtaining medical assistance.

Sea snakes are found in the warm water areas of the Pacific and Indian Ocean. Their venom is VERY poisonous but their fangs are

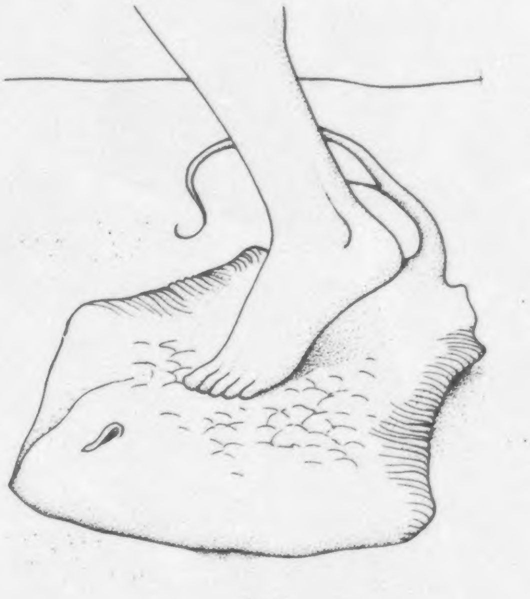

Figure 8-7.–Stingray.

only 1/4 inch long. Since their poison is both hemotoxic and neurotoxic, it is advisable to follow the first aid steps outlined for the treatment of hematoxic snakebites.

HUMAN AND LAND ANIMAL BITES

Wounds may also be caused by human or land animal bites. Such wounds are often torn, lacerated, and bruised. Human bites that break the skin may become seriously infected, since the mouth is heavily contaminated with bacteria. All human bites must be treated by a physician.

Animal bites, whether domestic (dogs, cats, etc.) or wild (bats, racoons, rats, etc.), always present the possibility of rabies in addition to tissue injury and infection. If at all possible, the animal inflicting the injury should be captured and impounded to observe for signs of rabies. If killing is necessary, do not damage the animal's head since it is necessary to examine the brain.

Treatment

1. Cleanse the wound thoroughly with soap or a detergent solution.
2. Flush it well with running water.
3. Cover with a sterile dressing.
4. Immobilize the injured extremity.
5. Transport the victim to a medical facility immediately.

CHAPTER 9

COMMON MEDICAL EMERGENCIES

Medical conditions not the result of some form of injury are grouped together under the general classification of common medical emergencies. These emergencies arise from many medical conditions that cause the person to require assistance.

Many persons wear a MEDIC-ALERT symbol (Fig. 9-1) for emergency medical identification. This is a warning device to alert medical personnel or laymen that the person wearing it has a medical condition requiring special treatment, or that he is allergic to certain medications or takes medications that can cause certain reactions. When you are involved in an emergency situation, always check the victim's wallet, clothing, wrist, or neck for an emergency medical identification card or tag. This symbol bears a warning on its back if the victim has epilepsy, diabetes, or a serious medical problem related to taking medicines.

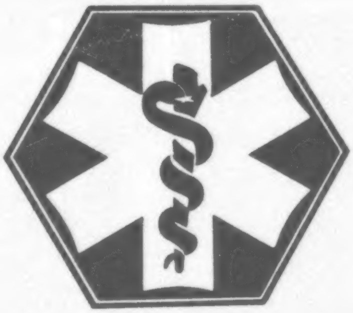

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Figure 9-1.—Medic-Alert Symbol.

UNCONSCIOUSNESS

Unconsciousness is a symptom of many different illnesses and injuries. It is important for the first-aider to know what condition might be responsible for the unconsciousness. Knowing this will enable him to give proper emergency care until medical personnel arrive.

If the cause of unconsciousness cannot be determined, the following actions should be taken. If the victim is pale, keep him lying down, his head level with or slightly lower than his feet. Keep him warm but do not overheat him. If the victim is flushed, keep him lying down, with his head and shoulders slightly raised. Apply cold compresses to his head.

FAINTING

A person who has merely fainted will regain consciousness within a few minutes. If an ammonia inhalant is available, break the ampule and place it near the victim's nose several times for a few seconds each time. If he is in a sitting position, lay him down gently. Loosen his clothing, apply a cold wet cloth to his face, and let him lie quietly. Any time a person is about to faint while sitting up, lower his head between his knees so that blood may flow to his head. Hold him so that he does not fall and injure himself.

DIABETIC COMA

When a diabetic person is unable to obtain the insulin necessary to fully burn and use fats and carbohydrates, the body's chemical balance is seriously affected, resulting in acidosis. If acidosis is severe, the person may ultimately lapse into a coma.

Signs and Symptoms. The victim's face is flushed, the skin is dry, the lips are cherry red, and he appears listless and drowsy. There is a characteristic sickly sweet odor of nail-polish remover on his breath. Care must be taken not to confuse the symptoms of diabetic coma with those of alcohol intoxication.

Treatment. Medical assistance must be summoned immediately. Give the patient insulin to save his life. If medical assistance will be delayed and insulin is not available, treat the victim for shock and give him large amounts of water. Unconscious victims may be given 2 quarts of salt solution by enema (1 teaspoon to a glass of water). NOTE: Since many persons in diabetic coma tend to vomit, the victim must be protected from sucking vomited material into the lungs. To do this ensure that his head is turned to one side.

INSULIN SHOCK

Insulin shock, also called hypoglycemia, occurs if there is too little sugar in the blood as a result of too much insulin.

Signs and Symptoms. The victim's skin is moist, clammy, and ashen. He has a rapid pulse but slow and shallow respiration. It should be noted that the victim of insulin shock does NOT have a characteristic breath odor.

Treatment. Obtain medical aid immediately. However, impressive changes can occur even before medical aid arrives if the victim is given sugar. If the victim is unconscious, place granulated sugar under the tongue or give a sugar solution by enema. Conscious victims may be given sugar in any available form. Should the victim go into convulsions, treat him as described in the section on Convulsions. Convulsions commonly occur when a victim's blood sugar level becomes too low; they require immediate medical attention.

STROKE

This condition, also called apoplexy, is caused by a rupture of blood vessels in the brain. The victim is usually over 50 years old and suffers an episode of sudden collapse.

Signs and Symptoms. The victim may experience sudden collapse with or without loss of consciousness. He may have a history of occasional episodes of dizziness and headache related to high blood pressure. During the attack the victim's face is red and congested. His mouth may sag to one side, with saliva drooling from it. Ultimately there may be loss of understandable speech and paralysis of one side of the body.

Treatment. Send for medical aid at once. Place the victim in a semireclining position and apply cool compresses to his head. Loosen his clothing, and keep him warm but not overheated. Watch closely for signs of breathing difficulties due to aspiration of excessive saliva or vomited material. If the victim goes into convulsions, prevent him from injuring himself. (See section on Convulsions.)

HEART ATTACK

The heart is a muscular organ whose major function is to pump blood to the various parts of the body. Oxygen is the fuel the heart uses to contract. During contraction the blood is squeezed from the heart chambers and distributed to all parts of the body.

In some cases the vessels outside the heart get clogged up. When that happens oxygen is unable to pass through the vessels to support the pumping action of the heart, and coronary thrombosis ensues. Coronary thrombosis may be fatal if proper emergency care is not given immediately.

Signs and Symptoms. The victim of an acute coronary thrombosis usually experiences severe, viselike pain in the chest, which may radiate down the left arm. His skin may be pale, moist, and cold, and he may collapse and lose consciousness.

Treatment. Keep the victim lying on his back, with head and shoulders elevated. If the victim can tolerate it, a half-sitting position is even better. Loosen all clothing to allow nonrestricted breathing. Keep the victim quiet and reassure him. Heart attack victims become very anxious. If the victim's heart stops beating, initiate cardiopulmonary resuscitation immediately. Experience has shown that most heart attack victims require CPR.

ANAPHYLACTIC REACTION

This condition, also called anaphylaxis or anaphylactic shock, is a severe allergic reaction of the body to foreign material. Penicillin and toxin from bee stings are probably the most common causative agents, although foods, inhalants, and contact substances can also initiate a reaction. Anaphylaxis can happen at any time, even to people who have taken penicillin many times before without experiencing any problems. This condition produces severe shock and cardiopulmonary failure. Death occurs if immediate first aid is not administered.

Signs and Symptoms. The most characteristic and serious symptoms are tightening of the voice box, loss of voice, and difficulty in breathing. Other typical signs are giant hives, coughing, and wheezing. Symptoms and signs of shock may develop, and the victim may die of respiratory failure.

Treatment. The first-aid management of the victim in anaphylactic shock consists in maintaining vital life functions. Maintain an open airway and ensure adequate breathing and pumping action of the heart. It should be noted that the victim of an anaphylactic reaction requires the immediate assistance of medical personnel.

CONVULSIVE SEIZURES

Convulsions, seizures, and fits are common names for a condition that is always alarming but not necessarily serious, thus it is important to stay calm. Convulsive seizures may be caused by epilepsy, drugs, poisoning, brain tumors, low blood sugar, and severe alcoholism, but they rarely result in death. Therefore the first-aider has time to administer effective care.

Signs and Symptoms. Most seizure victims present the following symptoms. After a period of extreme restlessness and irritability there is partial or total loss of consciousness. There are also some involuntary muscular movements, such as jerking, thrashing, and twitching, which may continue from minutes to hours, depending on the cause of the seizure. Towards the end of the seizure the victim falls into a deep sleep or quiet stupor. Although death rarely occurs because of the seizure itself, victims often die as a result of a sudden fall, burn, or accident incurred during the seizure.

Treatment. The major goal of treating a seizure victim is to protect him from injuring himself. Put a folded cloth or padded object between his teeth to prevent him from biting his tongue. If his teeth are closed tight, DO NOT attempt to pry them open. Pillows, blankets, rugs, etc., should be placed under his head and around his body to protect it from traumatic injury. Constricting clothing, such as ties and belts, should be loosened. No attempt should be made to hold down a convulsing victim. All efforts should be directed towards preventing him from injuring himself. Since the tongue of the seizure victim has a tendency to fall back in the airway during the attack, the first-aider must ensure that breathing remains adequate. If breathing stops for longer than one minute, mouth-to-mouth respiration must be started immediately. When the seizure victim passes into the deep-sleep phase, no attempt should be made to disturb him. Ultimately, medical attention must be provided.

ALCOHOL INTOXICATION

Acute alcoholic intoxication is, unfortunately, not an unusual condition, and only rarely is it arrived at by accident, unless a lack of judgment on the part of the consumer of alcohol can be considered accidental. Frequently, a situation arises in which a person with alcoholic intoxication requires first-aid care and sometimes medical assistance.

Signs and symptoms. The symptoms of alcohol intoxication are too well known to require mentioning. However, if the alcohol in the blood has reached toxic levels, a fatal outcome is possible, and very definite treatment is required.

Treatment

1. Induce vomiting, even if the victim has already vomited, in order to empty his stomach, and wash it out further with a solution of salt water (about 1 teaspoonful of salt to a glass) to get rid of any remaining alcohol and to soothe the inflamed lining of the stomach.

2. Follow with a large dose of Epsom salts or other saline laxative to purge the intestines.

3. Treat the victim for shock, and keep him warm and out of drafts, as pneumonia develops often in alcoholics.

4. If the intoxication is severe, the victim should be seen by medical personnel.

It must be emphasized that the person who is under the influence of alcohol must be observed carefully and, if necessary, cared for. If he is conscious, he will undoubtedly resist your efforts to assist him. Great tact is essential in dealing with these cases. Under no circumstances let an intoxicated person convince you that he is "perfectly all right."

DELIRIUM

Delirium is a condition of brain malfunction that stops short of unconsciousness. It may arise because of high fever, a head injury, head infections, pneumonia, chest wounds, severe burns with fluid loss, severe pain, poisoning by chemical agents, drug intoxication, drug withdrawal, and numerous other medical conditions. The victim may eventually become unconscious.

Signs and Symptoms. The delirious victim is periodically confused as to where he is, who he is, what day it is, and what he is supposed to be doing. His memory for what happened only 2 minutes before is poor. He may be extremely restless, anxious, and panicky; or he may be more quiet and withdrawn than usual. If he is restless, he may hallucinate or believe others will harm him. His speech may be slurred, and his thoughts are difficult to understand. The delirious victim must be approached in a calm, confident manner. If you show fear, he will be convinced that danger surrounds him and may strike out. Explain to the victim who he is, where he is, and what has happened to him. Keep his attention focused on you, away from his own imagination. With the help of friends, get him to a quiet place; and if he has a weapon, disarm him. A buddy must stay with him until he is evacuated, as he cannot be trusted to think clearly and may injure himself or others. Delirium, like unconsciousness, is a medical signal that the brain is not working well; it requires prompt medical attention.

DROWNING

Drowning occurs when air is shut off from the airway by water or any other fluid, causing spasm of the vocal cords and blockage of the airway. Many victims who appear lifeless may recover if artificial ventilation is performed promptly and efficiently. Speed is essential. Every moment of delay decreases the victim's chance of survival. It is frequently possible to start mouth-to-mouth ventilation before the victim is brought ashore. As soon as his head is clear of the water and his mouth is within reach of your mouth, start artificial ventilation. If other rescuers can help carry the victim ashore, do not interrupt artificial ventilation. Once the victim is ashore, do not waste valuable seconds to turn him in an attempt to drain water from his lungs, but continue artificial ventilation. Remember that an apparently lifeless person who has been immersed in cold water for a long time may be revived by prompt artificial ventilation.

ELECTRIC SHOCK

Electric shock accidents frequently result from contact with a "live" wire and occasionally occur when a person is struck by lightning. If a person has come in contact with an electric current, take the following steps:

1. Turn off the switch if it is nearby, but do not waste time looking for it. Instead use a

dry wooden pole, dry clothing, dry rope, or some other material that will not conduct electricity to remove the person from the wire. If the pole is not handy, simply drag the victim off the wire by means of a loop of dry rope or cloth. Do not touch the wire or the victim with your bare hands or you may be the second victim.

2. Administer artificial ventilation immediately after freeing the person from the wire if the electric shock caused breathing to cease. Check the victim's pulse, since electric shock may also cause his heart to stop. If you do not feel a pulse immediately, administer closed-chest heart massage with the artificial ventilation.

CHAPTER 10

NBC AGENT CASUALTIES

It is common knowledge that any poison that gets into your body may result in sickness or death. When NBC (nuclear, biological, chemical) warfare agents are used, poisons are released and casualties are almost certain.

The purpose of NBC warfare is to produce casualties. The agents used in NBC warfare may be strange to you, however, the physical problems that they cause are familiar enough.

Results similar to those occurring from chemical warfare (also called CW or gas warfare) can be seen in everyday events. Many automobile drivers have died from the effects of carbon monoxide gas. Firemen, also, have been overcome by deadly fumes. You have probably used chemicals such as fly spray to kill flies. The chemicals used in CW are more deadly and cover larger areas than fly spray—and they are aimed at you.

Next, consider biological warfare (called BW or germ warfare). A few harmful germs or organisms are present in everyday living and result in disease—like colds or diarrhea. Most contagious diseases such as measles, mumps, chicken pox are due to certain germs getting into the body. Although only a small percentage of germs are so deadly that they can result in death, you may have had friends or relatives who got such germs and died. Germ warfare is a man-made attempt to use germs to produce disease or death in man, animals, and plants.

Finally, certain aspects of nuclear warfare (NW) are not new to you. The painful results of overexposure to strong sunrays are a common experience. Taking X-ray pictures or X-ray treatments must be carefully controlled. In the wrong hands X-ray machines can be very dangerous and can cause severe sickness or death. In a nuclear explosion radiation is present in dangerous amounts, although the heat and blast present are much more deadly.

In brief, NBC agents are poisons in the form of gases, liquids, smokes, germs or germ products, and radioactive materials used in warfare to produce death, injury, or discomfort.

CHEMICAL AGENTS

Chemical agents are toxic (poisonous) chemicals which can produce death, injury, or irritating effects. These agents may be found as solid particles, liquids, or gases.

Chemical agents attack the body and produce specific damage according to the nature of the agent used. Shown below is a simple breakdown of the most common types:

1. Nerve agents
2. Blister agents
3. Psycho agents
4. Blood agents
5. Choking agents
6. Vomiting and tear agents

Nerve Agents

Of great importance because of their ACTION on your NERVOUS SYSTEM is a group of agents called "G-AGENTS." We will refer to them simply as nerve agents. They are quick killers. Very small amounts result in dimmed vision, headache, dizziness, and nausea. Upon entering your body through the nose, skin, or mouth, nerve agents interfere with breathing and may cause convulsions, paralysis, and death. The first effects are usually headache, difficulty in vision, and constriction of the eye pupils to pin-point size. These effects are usually followed by a running nose, nausea, stomach cramps, rapid breathing, tightness of the chest, twitching muscles, and cessation of breathing. This is the most important group of killer agents.

Right here it must be stressed that PROTECTION AGAINST NERVE AGENTS requires FOUR ACTIONS:

1. Speed in detection
2. Speed in masking
3. Speed in giving the alarm
4. Speed in self-aid and first aid

Blister Agents

As the name tells you, blister agents cause blisters on your skin. The result can be far worse than a severe case of sunburn. In either liquid or vapor form, these agents irritate and blister any part of your body that they touch. Blister agents can be effective in small amounts. A drop the size of a pinhead will produce a blister the size of a quarter. Blister agents are more effective in hot weather than in cold weather. They first affect the moist parts of the body (bend of arms and knees, armpits, and crotch). Men who are sweating are especially subject to severe burns. If you are exposed to blister agents, nothing will happen immediately. One to several hours will go by before your skin starts to turn red. It will be hours or even days later before the blisters appear. However, the damage is done during the first few minutes of exposure. That is the reason why speed (stressed later in the section on self-aid) is so all-important.

Damage to the eyes may be worse than the effects on the skin. Gases–even liquids–may irritate the eyes only mildly at first, or there may be no pain at all. In a few hours, however, your eyes will smart, become inflamed, and be sensitive to light. Tears and great pain will follow, and permanent injury may result. Some blister agents will cause the eyes immediate pain.

If breathed into your lungs, blister agents will inflame the throat and windpipe and produce a harsh cough. In serious exposure this may result in pneumonia and death. Quick detection of blister agents plus prompt protection against entry into the eyes, lungs, or skin is vital in order to escape harm.

Psycho Agents

Psycho agents produce mental symptoms and may also produce physical symptoms such as staggering gait, dizziness, and blurred vision. Some cause fainting spells, and some cause severe muscle weakness. The mental symptoms often resemble alcoholic drunkenness–men may act silly, giggle, or become angry and belligerent like a "fighting drunk." Sometimes psycho agents cause hallucinations. (Like alcoholic "DT's," victims may imagine they see snakes or enemy soldiers or imagine that colors have changed.) Many of these psycho gases prevent sleep. Some people may stay wide awake for 4 days and be mentally confused for the whole period. These agents do not kill but they make a man noneffective. Many of them do not produce effects until several hours after inhalation. These effects last from 8 hours to 4 days.

Blood Agents

Blood agents get their name because of the action they have on your blood. If you inhale blood agents the blood cannot furnish oxygen to the body cells. As a result, the body tissues suffocate and die. Rapid breathing followed by violent convulsions are the main symptoms when a large amount of blood agent is inhaled. A mild exposure may produce headache, dizziness, and nausea. Blood agents either will cause a speedy death or complete recovery will take place within a few hours. Like nerve agents, blood agents are quick killers; therefore speed in masking is essential. With these agents, it is very hard to build up effective concentrations in the air.

Choking Agents

Your lungs are the target for choking agents. If you can avoid breathing these agents, you are safe inasmuch as they do not harm your skin or digestive system. Choking agents will actually choke an unprotected person. If large amounts enter the lungs, the lungs will become filled with liquid, and death may result from lack of oxygen. Your protective mask gives you complete protection against all choking agents. The INSTANT you suspect the presence of a chemical agent, carry out these THREE ACTIONS as quickly as possible:

1. Stop breathing.
2. Put on your protective mask.
3. Clear your mask.

Protective mask drills will make you letter-perfect in these steps.

Vomiting and Tear Agents (Riot Control Agents)

Vomiting and tear agents produce unpleasant symptoms, usually only for a short time, and do not cause death when properly used. They are used to control riots, to force people out of buildings or caves, and sometimes, to capture enemy forces without injury. They are often used for training.

VOMITING AGENTS.–Inhaling vomiting agents makes you sick. A sense of fullness in the nose, a severe headache, intense burning in the throat, and tightness and pain in the chest are the general symptoms. These are followed by uncontrollable coughing, violent sneezing, nausea, and finally vomiting.

Remember that symptoms may be delayed several minutes. If you should inhale a vomiting agent before you get your protective mask on, you might get sick after your mask is on. It would be natural, then, to think that the mask is leaking and to take it off. If you do so, however, you will be exposed to more of the agent. This would be disastrous especially if the vomiting agent were combined with nerve, blister, or blood agents. It is quite possible that the enemy might do just this. The result would kill or seriously injure the man who took his mask off because he was sick. YOU MUST WEAR YOUR PROTECTIVE MASK AS LONG AS THE AGENT IS PRESENT. PULL IT AWAY FROM THE CHIN (DON'T TAKE IT OFF) DURING THE ACTUAL VOMITING. The protective mask offers adequate protection against vomiting agents. The undisciplined man, feeling terribly sick, will remove his mask and die, if toxic agents are also present. But the disciplined man, with as great an urge to take off his mask, will keep it on and live. Effects of vomiting agents usually wear off in 20 minutes to 2 hours.

TEAR AGENTS.–Tear agents are the least toxic of the six groups of chemical agents. They are discussed in this manual because you will encounter them during your training. They may also be used in civil riots to disperse the crowds or to squelch prison riots. The vapors of tear agents produce sharp, irritating pain in the eyes, resulting in an abundant flow of tears. There is no permanent damage to the eyes, however, and the effects wear off quickly. For a short time, though, you will not be able to see clearly. The protective mask, put on before tear agents get into your eyes, will give complete protection. One of the purposes of the gas chamber exercise is to prove to you how effectively your protective mask protects against agents which attack you through the nose, mouth, or eyes. Some of the new tear agents also cause a running nose, severe chest pains, nausea and vomiting.

Self-Aid

Self-aid and personal decontamination is your responsibility. If battle conditions at the time of exposure require you to keep fighting, you will decontaminate as soon as possible. In battle, it will be a tragic error for you to wait for someone else to give you first aid. The need for speed requires you to be your own aidman.

Time Limits

Since there are definite time limits after which self-aid becomes useless, immediate self-aid or personal decontamination is all-important if you are exposed to chemical agents. Decontamination either by neutralizing (making the chemical agent harmless) or by removing the agent, or both, should be done before serious injury occurs. If you have been contaminated with liquid nerve or blister agents, you must perform several self-aid measures as rapidly as possible.

Speed is essential in self-aid, and because you may not know whether you have been contaminated with liquid nerve agents or liquid blister agents, the following standard procedures must be observed to prevent injury from liquid agents:

1. Decontaminate eyes and face if necessary.
2. Mask.
3. Flush contaminated areas with large amounts of water.
4. Throw away contaminated clothing (or cut away the contaminated part).
5. Use the M258 kit for decontamination of skin.
6. ONLY if effects of nerve agents begin, use Combo Pen injection.

The self-aid procedure for specific agents is given in the following paragraphs, and should be employed if the agent has been identified.

Decontamination Kit–M258

The decontamination kit is issued for your use in applying self-aid to reduce or avoid injury from chemical agents. It contains the following items: (See figure 10-1)

1. Gauze pads
2. Scraping sticks
3. Two plastic capsules

Directions for use are as follows:

1. Take the cover off your M258 kit and place the T-handle through the kit's web strap so you don't lose it.

2. Take a piece of gauze from the kit and blot up any liquid agent on your skin. Use a second gauze if necessary.

3. If the contaminant is thick or greasy, use the scraping sticks to remove as much of the agent as possible.

CAUTION: The used gauze and sticks will be contaminated; dispose of them carefully.

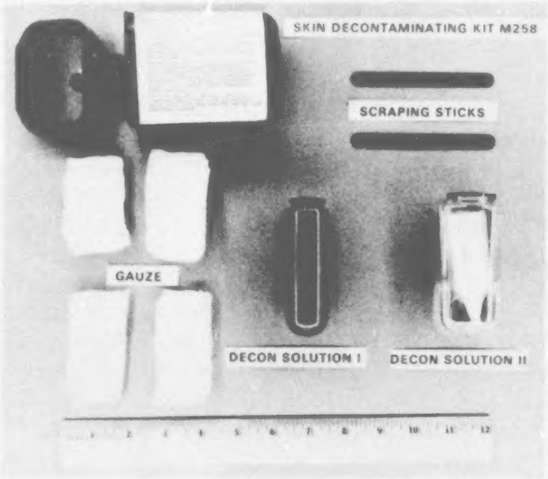

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Figure 10-1.—M258 Skin Decontamination Kit.

4. Remove the smaller of the two capsules marked "decon solution 1" and punch a hole in the capsule with the spike on the cover. Take out a gauze pad and wet it. Now swab the contaminated skin with the wet pad. After you have thoroughly swabbed the contaminated area, dispose of the gauze.

5. Take out capsule 2 marked "decon solution 2". Inside the flexible plastic capsule is a glass vial which must be broken. Use the heel of your boot or other hard object to break the vial. Then vigorously shake the capsule at least a dozen times, until the powder is dissolved. Then make a hole with the spike and wet another piece of gauze. Thoroughly swab the contaminated skin with solution 2.

This completes the skin decontamination procedure.

Self-Aid for Nerve Agents

Mask at once if you notice any of the following symptoms:

1. A faint, sweetish, fruity odor.
2. The pupils of someone else's eyes shrinking to pinpoint size.

3. Your sight blurring or dimming.

4. Running nose.

5. Salivation.

6. Tightness in your chest and difficulty in breathing.

If you are told that your pupils are getting very small, or if you are having trouble breathing and your chest feels tight, use the Combo-Pen injector. The injector contains medication to treat the initial symptoms of nerve agent poisoning. But most importantly it will check the more serious effects of nerve agent sickness. The injector is an antidote, not a preventive device—so only use the injector if you actually experience symptoms of nerve agent poisoning. See figure 10-2. The directions for use are as follows:

1. Pull off the injector's ridged safety cap.

2. Place the opposite end of the injector against your thigh.

3. Press down hard. Continue to press for at least four seconds to make sure you give yourself the whole injection. See figure 10-3.

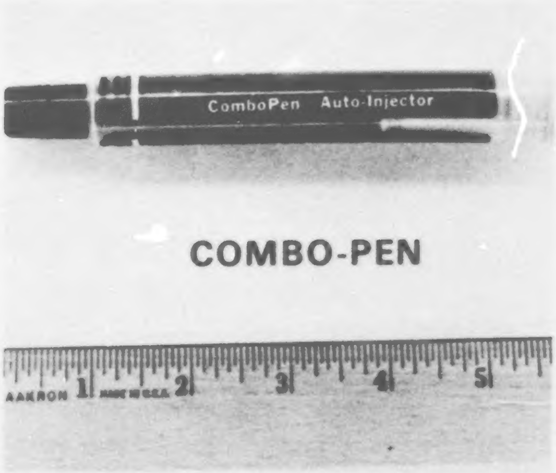

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Figure 10-2.—Combo Pen.

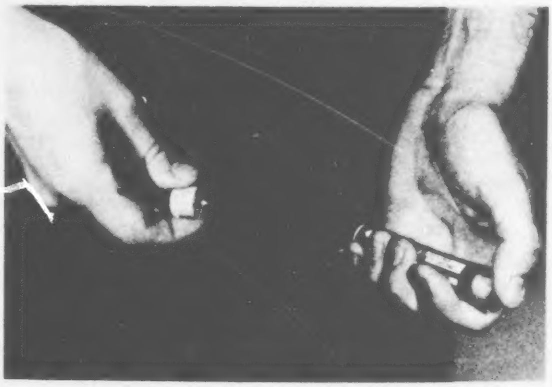

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Figure 10-3.—Injecting the Combo-Pen.

4. After you remove the injector, rub the area for a couple of minutes. This will help the antidote to be better absorbed. In about 5 minutes you should feel better. If you don't improve or you feel worse, use a second antidote injector. In time of war you will be issued two Combo-Pen antidote injectors.

CAUTION: For use ONLY in NERVE GAS poisoning.

Another type of automatic injector (atropine) may be issued to you. Complete directions for its use will be included with the injector.

Tips on the use of the atropine injector:

1. Inject the needle into a large muscle in the thigh or upper arm.

2. Place point of needle against skin, and then with firm pressure force the needle through the skin into the muscle all the way. You will feel little pain, only a slight pricking sensation.

3. The needle may be injected through the clothing.

PRECAUTIONS in applying self-aid for the nerve gases:

1. Do not take an injection of Combo-Pen or atropine until you are SURE you NEED it.

Pinpointing of the eye pupils or blurred vision along with a tightness in the chest and a hard time breathing are signs that you need it. If you get excited and inject yourself when you have not been exposed to a nerve agent, you will become ill, particularly in very hot weather. This would be a real danger in combat. However, if you really do inhale some nerve agent, either injector counteracts it and will make you feel better.

2. If you have inhaled a really large dose of nerve gas vapor, you may need more than one injection of atropine to relieve your symptoms. If nerve agent symptoms persist, you may give yourself two more injections for a total of three. More than three injections may be given under supervision of Medical Personnel, if available, or under direction of your NCO or officer in charge. If you are issued atropine, you will receive three injectors.

3. If you get good relief from the atropine and can breathe freely again, carry on with your duties. DRYNESS OF THE MOUTH IS A GOOD SIGN. It means that you have had enough atropine to overcome the dangerous effects of the nerve agent.

4. If you should get a drop or splash of liquid nerve agent in your eye, INSTANT ACTION is necessary to avoid serious injury. Get some water as fast as possible, tilt your head back so that your eyes look straight upward, and slowly pour water into the contaminated eye to flush it out. Hold the eye open with the fingers, if necessary. Pour the water slowly so that the irrigation will last not less than 30 seconds. This irrigation must be done in spite of the danger of breathing nerve gas vapor. Get your mask on quickly after completing the irrigation. Then if symptoms of nerve gases develop, give yourself an injection of the Combo-Pen or atropine.

5. If liquid nerve gas gets on your skin or clothing, fast action is needed to get rid of it. Immediately use the M258 decontamination kit. Then carry on with your combat duties. Meanwhile, notice if there is any twitching of the muscles under the contaminated area. If none develops in the next half hour and you have no tightness in your chest, your decontamination was successful and you can forget it.

6. If twitching of the muscles under the area of contaminated skin does develop, do not wait for the appearance of other symptoms, but give yourself an injection of the Combo-Pen or atropine AT ONCE. If no other symptoms develop, one injection of either is enough. The atropine does not relieve the local twitching of the muscles, but this twitching is not dangerous.

7. Avoid water and food that may be contaminated with nerve agents. Let the medics check food and water for safety before you use them. If you have swallowed contaminated food or water, and all of these symptoms occur–increased flow of saliva, nausea, pains in the stomach, and a tightness in the chest–give yourself an injection of the Combo-Pen or atropine.

First Aid for Nerve Agents

The most important things to do for a casualty who has been poisoned by a nerve agent are:

1. If you suspect the agent is still present, put his mask on him.

2. Give him a Combo-Pen or atropine injection from his kit.

3. Give artificial ventilation if needed. Mouth-to-mouth is the best method, but if you are still masked, you must, of course, use another (manual) method. Some of the latest protective masks have a coupling and a hose so that you can connect up and give mouth-to-mouth artificial ventilation while remaining masked.

4. Poisoning with nerve agents causes the mouth and throat to fill up with thick, sticky saliva. You may have to clear out the back part of the victim's mouth with a handkerchief, rag, or your fingers. Continue to check this as it may make artificial respiration difficult.

Self-Aid for Blister Agents

FOR THE EYES.–If blister agent gets in your eyes, treat it instantly, as every second counts. THIS IS IMPORTANT. If there is no pain in your eyes, treat them with water only (as described in 1. below). If there is pain in your eyes, flush eyes with water and seek medical aid immediately.

1. Flush the eye with water. The best way to do this is to tilt the head back so that the eyes look straight upward. Pull the lids apart with the fingers of one hand. With the other hand, pour water slowly into the eye. Try to regulate the flow of water so that the flushing lasts not less than 30 seconds and not more than 2 minutes.

2. SPEED in decontaminating the eye is ABSOLUTELY ESSENTIAL. Decontamination is very effective for the mustard agents if applied within the first few seconds, but after 2 minutes it does very little good.

For the Skin and Clothing

1. Use the M258 decontamination kit as previously described.

2. If the contamination is discovered late, when no liquid blister agent is visible and reddening of the skin has begun, wash contaminated area with soap and water. The decontamination kit will not help at this stage.

3. Cut off hair which becomes contaminated with liquid blister agent. Decontaminate the exposed scalp with the M258 kit, as described before.

4. If in a secure place, remove clothing which is contaminated with liquid blister agent. This applies to both ordinary clothing and to impregnated protective clothing. Decontaminate small areas with soap and water. It may be that the contamination is too great to handle with the equipment you have. In this case, cut out the contaminated parts or don't wear the clothes. When you are able, boil them with soap and water. This will make them safe to wear. The only exception to this is when the contaminating drops are very, very small (size of pinhead or smaller) and you are wearing both impregnated outer clothing and impregnated long underwear. The chemical in your impregnated clothes will take care of very small droplets.

Self-Aid and First Aid for Psycho Agents

By the time a victim of psycho agent exposure realizes something is wrong, he may be too confused mentally to do anything about it. He should be taken to medical personnel immediately. If many people are affected, it may be necessary to confine them temporarily under guard to prevent accidents. They must not be allowed in critical or dangerous spaces until completely recovered as they are not responsible for their actions. Some of these agents prevent sweating which increases the danger of sunstroke on hot days.

Self-Aid for Blood Agents

The first rule for the victim of a blood agent is to get your mask on and avoid unnecessary movements. If you have received a large dose, you need the assistance of an aidman. He will give you AMYL NITRITE to inhale and will administer artificial ventilation if you need it. You may be issued amyl nitrite ampules. In that event you can give the amyl nitrite to yourself. Just squeeze the ampule until it pops. Insert two ampules inside the facepiece of your mask under the eye lens. Repeat this at intervals of 3 or 4 minutes until normal breathing returns or until a total of eight ampules are used.

Self-Aid for Choking Agents

Put on your protective mask IMMEDIATELY upon detecting any phosgene in the air. The odor is like new-mown hay or fresh-cut corn. Phosgene can also be detected by irritation of the eyes or by change in the taste of your cigarette (it may become tasteless or offensive in taste). Try not to breathe while masking. Even if you have inhaled some phosgene, continue with your combat duties. If, however, you have a very hard time breathing, feel nauseated, or vomit, take it easy. Avoid unnecessary movement.

Self-Aid for Vomiting Agents

Put on your protective mask and wear it in spite of coughing, sneezing, salivation, or nausea. If necessary briefly lift the mask from the face to permit vomiting or to drain saliva from the facepiece. Clear your mask each time you adjust it to your face and before you resume breathing. CARRY ON YOUR DUTIES as VIGOROUSLY as possible; this will help LESSEN and SHORTEN the SYMPTOMS. Combat duties usually can be performed in spite of the effects of vomiting agents.

Self-Aid for Tear Agents

Put on your protective mask, cover the outlet valve, and blow hard to clear the mask. Keep your eyes open as much as possible. When vision clears, carry on your duties. When it is safe to remove your mask, blot away tears, but do not rub your eyes. If liquid or solid agent has entered your eye, force your eye open and flush it with water.

DECONTAMINATION

Decontamination can be done by removing, neutralizing, or destroying the agent. The purpose of personal decontamination is to remove toxic agents from your body or personal equipment before serious injury occurs.

An example of REMOVING is pinch-blotting the agent from your skin.

Using the M258 decontamination kit to make the agent harmless is NEUTRALIZING.

DESTROYING is burning or burying a contaminated cloth which was used to blot off the agent.

Use Common Sense

Common sense and quick thinking play a big role in personal decontamination. You may have to rely on whatever you have on hand to remove chemical agents from your skin, eyes, or equipment. If liquid nerve or blister agents touch any part of your body, remove them as fast as you can. If you are caught without the best removers, like the M258 kit or soap and water, then use anything that is available. It may be mud, gun oil, or even urine. A crude remover may get off only two-thirds of the agent, but it is better than nothing. You must keep in mind the fact that nerve and blister agents penetrate very fast. You CAN'T WAIT for help. GET THEM OFF!

Soap and Water

Always carry a bar of soap with you. Soap is excellent for removal of chemical agents. If plenty of cold water is available, it is very effective because you can pour it on for several minutes. Hot soapy water removes agents in a hurry. When you are removing any agent from your body with soap and water, scrub just as vigorously as a doctor scrubs his hands before an operation. Exposed regions and hairy regions should be given extra attention.

DEFENSE AGAINST BIOLOGICAL WARFARE

Biological warfare (BW) is the deliberate use of germs or their poisonous products to produce disease, injury, or death in man, animals, or plants. It is the intentional use of biological agents that makes BW new and dangerous.

You have been waging an individual fight against germs since you were born. The doctor who delivered you at birth made certain that your eyes were disinfected and free from dangerous germs. Your mother guarded you against disease by frequently bathing your body, sterilizing your milk bottle, and keeping you away from people with colds. One of the first things you did on becoming a sailor was to take "shots" to protect you from diseases like typhoid fever. During World War II, naval personnel in tropical areas were careful to take atabrine to guard against malaria.

Any belief that biological warfare concerns a new or mysterious super-weapon is NOT BASED ON FACT. Our fight against disease-producing germs has been going on for hundreds of years. BW is a man-made attempt to produce disease on a large scale.

Characteristics of BW Agents

Since germs are alive, they behave as do other living things. They multiply, breathe, eat, grow, and die. They depend on moisture, food, and certain limits of temperature for life and growth. When their surroundings do not provide suitable conditions, they die. Most germs are killed by simple acts that you know about, such as boiling water, adding chlorine tablets to water, cooking food, exposure to sunlight, and use of soap and water. BW agents or their poisonous products attack your body by the same routes as chemical agents–through your nose, mouth, or skin.

Dangers of BW

In spite of the Navy's fine health program, BW does hold dangers that you must be prepared to meet. There is little to worry about from new kinds of diseases. The real danger to you is in new ways of spreading diseases already known.

When a person coughs or sneezes, tiny drops of moisture are blown from his mouth and nose into the air. If he is ill, the spray may carry harmful germs to others. Scientists working in laboratories have found that they are able to spread disease germs in much the same way, that is, floating the germs in fine sprays or mists called aerosols. Aerosols might be used for large BW attacks. They could be released from special sprayers carried by airplanes. When diseases are spread through the air in aerosols, anyone who breathes the mist is very likely to get a number of germs in his lungs. In that vital spot, germs can easily be distributed to other parts of the body.

Protection Against BW

Defense against BW, like defense against CW, is neither simple nor easy. Individual protection against BW attack includes the use of protective equipment. Your protective equipment used for defense against chemical warfare may be used for defense against BW. You will find that your first line of defense against BW is the natural resistance of your own body. Keep yourself in top physical condition. Every time you drill, engage in physical exercise or sports, hike, or eat good meals, you are preparing strong defenses against BW. A high standard of personal cleanliness and careful attention to sanitation are your best insurance against the spread of disease. Such steps are bolstered by the "shots" you get from time to time.

Inhaling airborne germs is a great danger in BW. Your protective mask, therefore, is an important item. A properly fitted mask which has been kept in good condition will greatly reduce the danger of your inhaling germs present in the air. Since you cannot detect the presence of biological agents, you may be ordered to use your protective mask and protective equipment until the danger has passed. Your CO will base his decision upon information received from intelligence reports and the advice of his technical staff or higher headquarters.

Germs must actually get inside your body to cause disease. However, if a great many germs collect on your skin, they might get into your body in several ways, such as through your nose or mouth. Cuts or open sores are open doors to germs trying to enter your body. Be sure to keep cuts bandaged. Any type of clothing will give you some protection against BW. The degree of protection depends upon the size of the pores in the fabric and the number of layers of clothing worn. In order to keep out germs and disease-bearing insects such as mosquitoes, fleas, and ticks, it is important that the shirt and jacket collars be fastened, sleeves rolled down, cuffs buttoned, and all other clothes tied down to stop entry of germs which may be in the air or on the ground. The uniform you use for protection against chemical agents gives a higher degree of protection against BW agents than your ordinary clothing.

Treatment of BW Casualties

If you've ever had measles, you will remember that you had no idea when or where you were exposed. Several days after you were exposed to the germ you began to feel sick. Then the red rash appeared. Diseases caused by BW appear in this same way. THERE IS NO SELF-AID FOR BW CASUALTIES. The Navy gives you preventive "shots" for some diseases. If BW is ever used, additional "shots" have been developed which will be given to all hands. If you contract a disease from BW in spite of the "shots", the sickness will be mild, and you will get the best treatment that the medical personnel can give you.

Decontamination

If you are exposed to BW agents, scrub yourself thoroughly with soap and water as soon as the combat situation permits. Pay careful attention to your face and hands. A fingernail brush is a good item to have in order to remove dirt under your nails. Brush your teeth frequently–the roof of your mouth and tongue, as well as the gums and teeth. Take a bath or shower when it is possible. Change your clothes if they are contaminated. All washable clothes polluted with germs should be scrubbed clean at the first opportunity.

You should always be careful what you eat and drink in combat. If you are told that a BW attack has been made, you must be doubly careful. One of the easiest ways to get germs inside your body is to swallow them along with food and water. Don't forget that food and water are the natural homes of many disease producers. A few germs in your food will grow into millions in a very short time. Learn the commandments for defense against BW:

1. Remember the "BIO" sign; it means the area is contaminated with biologic agents.
2. Don't pick and eat fruits or berries.
3. Don't chew grass or leaves.
4. Don't eat native food or drink native beverages. They may be contaminated intentionally or unintentionally.
5. Don't take souvenirs.
6. Eat only Navy food and drink only Navy beverages.
7. Don't bathe in lakes or ponds.
8. Don't touch animals.

Survival Tips for BW

1. REPORT SICKNESS PROMPTLY. If you get sick, notify your unit medical personnel immediately.

2. KEEP YOURSELF AND YOUR LIVING QUARTERS CLEAN. Don't help germs by making things easy for them. Germs have trouble living in clean places. If you keep clean, the odds increase that you won't get sick.

3. DON'T NEGLECT PREVENTIVE MEDICINE. Take pills, "shots," or vaccinations when you are told to do so.

4. KEEP YOUR NOSE, MOUTH, AND SKIN COVERED. When BW agents are known to be present or are suspected of being present, use all of your protective equipment to keep them out of your body.

5. KEEP YOUR FOOD AND WATER PROTECTED. Bottled or canned foods are safe after a BW attack if the seals are not broken. Food in the open will be contaminated. If in doubt, boil the food for 10 minutes. That will kill most of the germs. Clean cans, packages, etc., with soap and water before opening.

6. KEEP ALERT TO ANY SIGNS OF BW ATTACK. Any clues such as new or unusual types of shells or bombs, strange material sprayed by airplanes, smokes or mists of unknown nature, or other strange substances should be reported to your CO immediately.

WATCH OUT FOR BW "BOOBY TRAPS." The enemy may challenge your discipline and self-control by making available all sorts of tempting items of food. To eat or drink these contaminated items may mean death.

DEFENSE AGAINST NUCLEAR WARFARE

The explosion of a nuclear weapon like that of an ordinary bomb, causes damage by heat and blast. In addition, the nuclear explosion presents a third danger–nuclear radiation. You do not need to become an expert on the nuclear bomb, but there are some facts that you must understand to protect yourself from this weapon and nuclear radiation. Nuclear radiation is emitted at the time the bomb explodes, and also by particles called "fallout" which result from the bomb. These may cover large areas–many hundreds of square miles.

Effects of Nuclear Explosions

Although radiation is only one effect of a nuclear explosion, it has received much attention. To many, this effect has an air of mystery. Predictions were made that Hiroshima would never again be a safe place to live. Many rumors dealt with horrible injuries and sickness due to radiation. However, Hiroshima has been rebuilt. Crops grown in that area are safe to eat. The people are healthy and normal. The truth is that HEAT AND BLAST CAUSE MOST of the INJURIES.

Dangers of Radiation

You have already had contacts with radiation. In the form of rays from the sun, you have been bombarded by radiation every hour of your life. You know that too much exposure to the sun will result in severe sunburn. The effects of radioactivity may be compared to severe sunburn. You have also had X-rays taken of your chest. This was done by sending invisible, but powerful, rays into your body. You have heard of doctors using radium in the treatment of cancer. In receiving this treatment, the patient was exposed to powerful radiations. If you are an athlete, you may have taken infrared lamp treatments for a "charley horse." Like sun rays, X-rays and infrared rays, nuclear radiation is not a mysterious occurrence, but is easily understood by comparison with the above examples.

Radiation, like BW agents, cannot be heard, seen, tasted, smelled, or felt. For example, when an X-ray is taken of your hand, you feel nothing. However, millions of X-rays have gone through your hand to the photographic plate. The light-shaded outline of your bones on the negative means that millions of X-rays have been absorbed by your bones. Too many X-rays will cause injury. They tend to tear down the body cells, especially the blood-forming cells. That is why a safety limit is set up. X-ray machine operators are only allowed to be exposed to a certain amount of radiation in a week. Service personnel working a radioactive or "hot" area will not be allowed to be exposed to radiation beyond a safe limit, which will be determined by their commander.

How Radiation Affects You

There are two ways you can acquire an overdose of radiation. You can be caught in the open when a nuclear bomb explodes nearby. If your distance from the point of explosion is great enough to protect you from blast and heat, radiation cannot reach you. However, if you are in the open within 800 to 1,000 yards of the burst, you will receive an overexposure to radiation. Your clothes will not stop the radiation. Overexposure occurs if you remain too long in an area which is radioactive from fallout. Your commander will tell you how long to stay in a radioactive area.

The first indication of an overdose of radiation probably will not show up for several hours or days. Then you most likely will get sick and begin to vomit. The time it takes you to get sick depends on how large a dose you get. The larger the dose, the quicker you get sick. For a few days you might continue to feel below par. But in spite of it all, you would still stand a better than even chance of complete recovery.

NW Protective Measures

In order to protect yourself against NW, you must know about the different kinds of nuclear explosions.

An AIR BURST is a nuclear explosion high in the air. This type of explosion does the greatest damage by blast and heat. The radiation from an air burst disappears fast and is called INITIAL RADIATION.

A GROUND or WATER BURST is one which is low or on the surface. It produces less damage from blast and heat. It produces fallout radiation which lasts for quite a long time and is called RESIDUAL RADIATION.

Since an air burst does the greatest damage, that is the kind you can expect most often. With air bursts, the violent, upward surge of superhot gases and air sweeps radioactive ashes into the sky. Most of them are carried off in the drifting bomb clouds. Air explosions do not create "hot" areas. In fact, they leave almost no radiation on the ground. After a few minutes, your unit can move across the center of destruction with no danger from harmful rays.

Ground, underground, or water bursts leave a limited area "hot." Such bursts will limit the time that fighting forces can stay there.

Self-Protection

AIR BURSTS.–The important point to remember is that in a nuclear explosion, you do the same thing you would do in an ordinary bomb explosion. Speed in taking cover is vital. You must protect yourself from heat and the blast. Remember that residual radiation after an air burst is a very small danger. But initial radiation at the time of explosion is very dangerous. Fortunately, these initial rays are gone 10 seconds after the bomb explodes. If you take cover for a minute or two you should escape harm unless the explosion occurs very close to you. As with any explosion, the more material or distance between you and the burst, the safer you are. Falling flat and covering your face is better than standing. As is true with protection from all the dangers of war, you must make the most of what you have. Your training on protection against small arms or artillery fire is also good training for protection against nuclear bombs.

First Aid

In the case of an air burst, you may give first aid to casualties who received injuries from nuclear explosions without fear of becoming contaminated by the casualties. If the weapon has been detonated close to the ground, both you and the casualties may have some radioactive fallout on your skin and clothing. Your unit NBC personnel can tell you whether the amount is serious or not. Most of it can be removed by simply dusting and shaking your clothes. Treat for hemorrhage, shock, wounds, fractures, burns, and other injuries. These are by far the more important effects of the bomb. Men who have received radiation injury alone will need no first aid since the only symptoms they will show are vomiting and diarrhea, which will not occur right away.

Protective Equipment

CLOTHING.–Any type of clothing that covers you gives some protection against NW. In order to protect the clothes you are wearing from radioactive materials, extra covering is desirable. For example, if you are caught in the open, try to grab something to cover yourself when you fall to the ground. A board or some sheets of newspaper will help, but your raincoat is better. Light colored material will offer better protection against the heat effects. The object is, of course, to keep radioactive dust off your body and regular clothing.

GLOVES AND MASK.–When you enter a "hot" area, you must wear gloves to protect your hands. Touching radioactive material with bare hands may result in serious burns. Any kind of gloves will protect your hands. Later when you wash your hands, it will be easier to decontaminate them, especially your fingernails, if you have worn gloves. Your protective mask or dust respirator should be worn in a "hot" area to prevent inhalation of radioactive material. The point to remember is never to inhale radioactive material. Serious internal injury and radiation sickness may result.

Decontamination

If you suspect that you are contaminated, or, if detection equipment shows that you are, report to a personnel decontamination station as directed. Outer clothing will serve as a trap for most radioactive contamination. By taking off your clothes you may remove most of the contamination.

Upon reporting to the personnel decontamination station, follow the directions of the men operating the station. If decontaminating personnel are not available, necessary instructions will be posted on signs. Obey them to the letter.

The usual procedure at the personnel decontamination station is as follows: Discard clothing and equipment as directed. Enter shower and take a good bath, using plenty of soap and warm water. In washing, pay close attention to the hairy parts of your body and to your body creases. It is at these points that dirt, probably contaminated dirt, tends to gather. Do not forget your fingernails. After you have finished your shower, you will be directed to a monitor who will check you with a radiation detector. If you are still contaminated, you will be sent back to take another shower. If you are free from contamination, you will go to the dressing room for a new issue of clothing and equipment.

Remember that bathing is the best way to remove radioactive contamination from your body. No special cleaning compound is necessary. Soap, stiff brushes, and warm water will do the job.

Food and water can become contaminated. Avoid using uncovered food or water if they are in a radioactive area. Canned food and covered water may be used with safety, after the outside of the containers are decontaminated. Rely on trained personnel to check and declare harmless anything you taken into your mouth.

DECONTAMINATION EXPEDIENTS.–If the military situation does not permit you to go to a decontamination station, you must be able to remove most of the radioactive material with whatever you have on hand. If you become heavily contaminated–

1. Remove your outer garments. Shake them vigorously or brush them off. Be sure that the clothing is held downwind. This will remove most of the radioactive material, unless it is wet and muddy.
2. If it is too cold or wet to remove your outer clothing, brush or scrape them carefully.
3. This same procedure should be used to decontaminate your equipment.

CHAPTER 11

RESCUE AND TRANSPORTATION PROCEDURES

It is a basic principle of first aid that an injured person must be given essential treatment BEFORE he is moved. However, it is obviously impossible to treat injuries while the casualty is in a position of immediate danger. If he is drowning, or if his life is endangered by fire, steam, electricity, poisonous or explosive gases, or other hazards, he must be rescued before first aid treatment can be given.

The life of an injured person may well depend upon the manner in which he is being transported to a medical officer. Rescue operations must be accomplished quickly, but unnecessary haste is both futile and dangerous. After rescue, and after essential first aid treatment has been given, further transportation must be accomplished in a manner which will not aggravate his injuries.

In this chapter we will consider the use of common types of protective equipment, phases of rescue operations, ways of effecting rescue from dangerous situations, emergency methods of moving injured persons to safety, and procedures for transporting them after first aid has been given.

PROTECTIVE EQUIPMENT

The use of appropriate items of protective equipment will increase your ability to rescue a person from life threatening situations. Protective equipment that is generally available on naval vessels and at some shore activities includes oxygen breathing apparatus; hose (air line) masks; protective (gas) masks; asbestos suits; steel-wire life lines; and devices for detecting oxygen insufficiency, explosive vapors, and some poisonous gases.

Oxygen Breathing Apparatus

Oxygen breathing apparatus is provided for emergency use in compartments containing toxic gases and in which there is insufficient oxygen to support life. There is no limitation as to the concentration of gas, smoke, dust, or deficiency of oxygen in which the apparatus will function effectively. The apparatus is particularly valuable for rescue purposes because it is a self-contained unit. The wearer is not dependent upon outside air or upon any type of air line, within the effective life of the canister.

There are several types of oxygen breathing apparatus, but they are all similar in operation. Independence of the outside atmosphere is achieved by having air within the apparatus circulated through a canister. Within the canister, the air is continuously replenished with oxygen and continuously freed of impurities. The effective life of the canister varies from 45 minutes to 20 minutes, depending on the particular apparatus and the type of work being done. One of the newer types of oxygen breathing apparatus, is designed so that you can change canisters without leaving the toxic atmosphere.

If you are to enter an extremely hazardous area, you should also wear a lifeline. The lifeline should be tended by two persons, one of whom is also wearing a breathing apparatus.

Never allow oil or grease to come in contact with any part of an oxygen breathing apparatus. Oxygen is violently explosive in the presence of oil or grease. If any parts of the apparatus become contaminated with oil or grease smudges, clean it before it is stowed. Care should be taken to prevent oil or oily water from entering the canister between the time it is opened and the time of disposal.

Hose (Air Line) Masks

Hose masks are part of the allowance of all ships having repair party lockers. They are smaller than the oxygen breathing outfits, and can therefore be used by persons who must enter voids or other spaces which have very small access hatches. The hose or air line mask consists essentially of a gas mask facepiece with an adjustable head harness and a length of airhose. Note that the air line mask uses AIR rather than pure oxygen. It must NEVER be connected to an oxygen bottle, oxygen cylinder, or other source of oxygen; even a small amount of oil or grease in the air line mask would combine rapidly with the oxygen and cause an explosion. When properly connected to a suitable source of AIR, such as the low-pressure ship's service air line, the hose mask can be worn safely even in spaces which contain a high concentration of oil or gasoline vapors; for this service, the air line mask is superior to the oxygen breathing apparatus.

Safety belts are furnished with each air line mask, and MUST BE WORN. A lifeline must be fastened to the safety belt; and the lifeline should be loosely lashed to the airhose to reduce the possibility of fouling. The airhose and lifeline must be carefully tended at all times, so that they will not become fouled or cut. The person wearing the air line mask and the person tending the lines should maintain communication by means of standard divers' signals.

Protective (Gas) Masks

Protective (gas) masks provide respiratory protection against nuclear, biological, and chemical warfare agents. They do not provide protection from the effects of carbon monoxide, carbon dioxide, and a number of industrial gases. Protection of these gases are discussed in "Rescue From Unventilated Compartments."

In emergencies, protective (gas) masks may be used for passage through a smoke-filled compartment or for entry into such a compartment to perform a job that can be done quickly, such as close a valve, secure a fan or de-energize a circuit. However, they provide only limited protection against smoke. The length of time you can remain in a smoke-filled compartment depends on the type of smoke and its concentration.

The most important thing to remember about protective (gas) masks is that they do not manufacture or supply oxygen. They merely filter the air as it passes through the canister. Therefore, the protective (gas) mask should not be used in air containing less than 16 percent oxygen, or in air having a heavy concentration of smoke from oil fires, except for very short periods of time.

Asbestos Suit

The Navy asbestos suit is made in a single unit, is easy to get into, and provides complete cover for the wearer. With it on, a firefighter can move quickly through flame to effect a rescue or perform some other job that can be done quickly.

While asbestos will not burn, it will char and conduct heat. Therefore, the suit provides protection against flame only for short periods of time. The length of time the suit can be worn depends upon the conditions under which it is used. The person wearing the suit should return immediately to a safe, cool area if he experiences severe discomfort such as difficulty in breathing or extreme heat. Heavy clothing should be worn under the suit to give additional protection from heat.

If the asbestos suit becomes wet, as is more than likely in firefighting, the wearer might be scalded, unless he withdraws from the heated area before the water turns to steam. Continued wetting will keep him cool, but the suit will become water-soaked and reduce his freedom of movement, already restricted by the cumbersome suit.

Lifeline

The lifeline is a steel-wire cable, 50 feet long. Each end is equipped with a strong hook that closes with a snap catch. The line is very pliable and will slide freely around obstructions. See figure 11-1.

Lifelines are used as a precautionary measure to aid in the rescue of persons wearing rescue breathing apparatus, hose masks, or similar equipment. Rescue, if necessary, should be accomplished by having another man or men equipped with breathing apparatus follow the lifeline to the person being rescued, rather than by attempting to drag him out. Attempts to drag a person from a space may very well result in fouling the lifeline on some obstruction or in parting his harness, in which case it would still be necessary to send a rescue man into the space.

An important precaution in the use of lifelines should be obvious, but it is stated here because in the excitement of fire or other emergency it may be forgotten. A stricken person must never be hauled up by a lifeline attached to his waist. He may be dragged along the deck a short distance, but his weight must never be suspended on a line attached to his waist. If he is not wearing a harness of some kind, the line must be passed around his chest under his armpits and made fast either front or back.

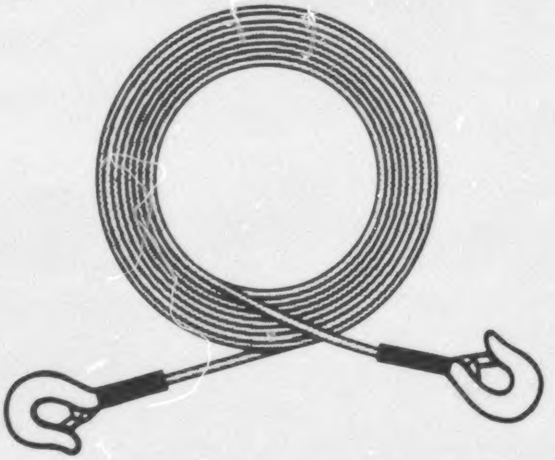

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Figure 11-1.—Steel-Wire Lifeline.

When tending a lifeline, you must wear gloves to be able to handle the line properly. Play out the line carefully, so that it will not foul. Try to keep the lifeline in contact with grounded metal, and do not allow it to come in contact with any energized electrical equipment.

Detection Devices

The detection devices used to test the atmosphere in closed or poorly ventilated spaces include the FLAME SAFETY LAMP, for detecting oxygen deficiency; COMBUSTIBLE-GAS INDICATORS, for determining the concentration of explosive vapors; and TOXIC-GAS INDICATORS, such as the CARBON-MONOXIDE INDICATOR, for finding the concentration of certain poisonous gases. These devices are extremely valuable, and should be used whenever necessary; however, they MUST BE USED ONLY AS DIRECTED. Improper operation of these devices may lead to false assurances of safety; or, worse yet, to an increase in the actual danger of the situation. For example, the use of a flame safety lamp in a compartment filled with acetylene or hydrogen could cause a violent explosion.

RESCUE PROCEDURES

If you are faced with the problem of rescuing a person threatened by fire, explosive or poisonous gases, or some other emergency, do not take any action until you have had time to determine the extent of the danger and your ability to cope with it. In a large number of accidents the rescuer rushes in and becomes the second victim. Do not take unnecessary chances! Do not attempt any rescue that needlessly endangers your own life!

PHASES OF RESCUE OPERATIONS

In disasters where there are multiple patients (as in explosions or ship collisions), rescue operations should be performed in phases. These rescue phases are distinct and different from emergency care priorities and apply only to extrication operations.

The first phase is to remove lightly pinned casualties, such as those who can be freed by lifting a beam or removing a small amount of debris.

In the second phase, remove those casualties who are trapped in more difficult circumstances but who can be rescued by use of the equipment at hand and in a minimum amount of time.

In the third phase, remove casualties where extrication is extremely difficult and where much time can be taken to effect the rescue. This type may possibly involve cutting through decks, breaching walls, removing large amounts of debris, or cutting through an expanse of metal. An example would be rescuing a worker from beneath a large, heavy piece of machinery.

The last phase is the removal (extrication) of dead bodies.

Rescue From Fire

If you must go to the aid of a person whose clothing is on fire, try to smother the flames by wrapping him in a coat, a blanket, or a rug. Leave his head UNCOVERED. First beat out the flames around his head and shoulders, and then work downward toward his feet. If you have no material with which to smother the fire, roll him over–SLOWLY–and beat out the flames with your hands. If he tries to run, catch him and throw him down. Remember that he MUST lie down while you are trying to extinguish the fire. If he runs, his clothing will burn rapidly. If he sits or stands, he may be killed instantly by inhaling flames or hot air.

CAUTION: Inhaling flame or hot air can kill YOU, too. Don't get your face directly over the flames. Turn your face away from the flame when you inhale.

If your own clothing catches fire, roll yourself up in a blanket, coat, or rug. KEEP YOUR HEAD UNCOVERED. If material to smother the fire is not available, lie down, roll over slowly, and beat at the flames with your hands.

If you are trying to escape from an upper floor of a burning building be very cautious about opening doors into hallways or stairways. When a building is on fire, hot air often collects in halls and stairwells. Always feel a door before you open it; if it feels hot, don't open it if there is any other possible way out. Remember, also, that opening doors or windows will create a draft and make the fire worse; so don't open any door or window until you are actually ready to get out.

If you are faced with the problem of removing an injured person from an upper story of a burning building, you may be able to improvise a lifeline by tying sheets, blankets, curtains, or other materials together. (Use square knots.) Secure one end around some heavy object inside the building, and fasten the other end around the casualty under his arms. You can lower him to safety, and then let yourself down the line. Do not jump from an upper floor of a burning building except as a last resort.

It is often said that the "best" air in a burning room or compartment is near the floor, but this is true only to a limited extent. There is less smoke and flame down low, near the floor, and the air may be cooler; but carbon monoxide and other deadly gases are just as likely to be present near the floor as near the ceiling. If possible use oxygen breathing apparatus or other protective breathing equipment when you go into a burning compartment. If protective equipment is not available, cover your mouth and nose with a wet cloth to reduce the danger of inhaling smoke, flame, or hot air. REMEMBER, HOWEVER, THAT A WET CLOTH GIVES YOU NO PROTECTION AGAINST POISONOUS GASES OR LACK OF OXYGEN!

Rescue From Steam-Filled Spaces

It is sometimes possible to rescue a person from a space in which there is a steam leak. Since steam rises, escape upward may not be possible. If the normal exit is blocked by escaping steam, move the casualty to the escape trunk or, if there is none, to the lowest level in the compartment.

The equipment which offers protection against fire does NOT protect you against steam. In particular, it should be mentioned that the asbestos suit absorbs water, and is therefore of no value in a steam-filled space. Steam would penetrate the asbestos very quickly and the person wearing the suit would be scalded.

Rescue From Electrical Contact

Rescuing a person who has received an electric shock is likely to be difficult and dangerous. Extreme caution must be used, or you may be electrocuted yourself.

YOU MUST NOT TOUCH THE CASUALTY'S BODY, THE WIRE OR ANY OTHER OBJECT WHICH MAY BE CONDUCTING ELECTRICITY.

Look for the switch first of all, and if you find it, turn off the current immediately. Don't waste too much time hunting for the switch, however; every second is important.

If you cannot find the switch, you should try to remove the wire from the casualty with a DRY broom handle, branch, pole, oar, board, or similar NONCONDUCTING object. It may be possible to use DRY rope or DRY clothing to pull the wire away from him. You can also break the contact by cutting the wire with a WOODEN-HANDLED axe, but this is extremely dangerous because the cut ends of the wire are likely to curl and lash back at you before you have time to get out of the way. When you are trying to break an electrical contact, always stand on some nonconducting material such as a DRY board, DRY newspapers, or DRY clothing.

Rescue From Unventilated Compartments

Rescuing a person from a void, double bottom, gasoline or oil tank, or any closed compartment or unventilated space is generally a very hazardous operation. Aboard naval vessels and at naval shore activities, no person is permitted to enter any such space or compartment until a damage control officer (or some person designated by him) has indicated that the likelihood of suffocation, poisoning, and fire or explosion has been eliminated as far as possible. The rescue of a person from any closed space should, therefore be performed under the supervision of a damage control officer, or in accordance with his instructions. In general, it is necessary to observe the following precautions when attempting to rescue a person from any closed or poorly ventilated space:

1. If possible, test the air for oxygen deficiency, poisonous gases, and explosive vapors.
2. Wear a hose (air line) mask or oxygen breathing apparatus. The air line mask is preferred for use in spaces which may contain high concentrations of oil or gasoline vapors. Do not depend upon a protective (gas) mask or a wet cloth held over your face to protect you from oxygen deficiency or poisonous gases.
3. Before going into a compartment which may contain explosive vapors, be sure that men are stationed nearby with fire-extinguishing equipment.
4. When going into any space which may be deficient in oxygen or which may contain poisonous or explosive vapors, be sure to maintain communication with someone outside. Wear a lifeline, and be sure that it is tended by a competent person.
5. Do not use, wear, or carry any object or material which might cause a spark. Matches, cigarette lighters, flashlights, candles or other open flames, and ordinary electric lights must NEVER be taken into any compartment which may contain explosive or flammable vapors. The kind of portable light used by cleaning parties in boilers, fuel tanks, and similar places may be taken into a suspect compartment; this is a steamtight glove-type light in which all exposed metal parts are either made of nonsparking alloy or are protected in some way so that they will not strike a spark.

Electrical apparatus, or tools, which might spark must never be taken into a compartment until a damage control officer has indicated that it is safe to do so. When electrical equipment is used—as, for example, an electric blower might be used to vent a compartment of explosive vapors—it must be of an approved explosion-proof type, and it must be properly grounded.

If you must go into a space which may contain explosive vapors, do not wear clothing which has any exposed spark-producing metal. For example, do not wear boots or shoes which have exposed nailheads or rivets, and do not wear coveralls or other garments which have steel buttons, belt buckles, or other items which might scrape against metal and cause a spark.

A particular caution must be made concerning the use of the steel-wire lifeline in compartments which may contain explosive vapors. If you use the line be sure that it is carefully tended and properly grounded at all times. When other considerations permit, you should use a rope line instead of the steel-wire lifeline when entering compartments which may contain explosive vapors.

Rescue From the Water

You should never attempt to swim to the rescue of a drowning person unless you have been trained in lifesaving methods—and then only if there is no better way of reaching him. A drowning person may, in his panic, fight against you so violently that you will be unable either to rescue him or to save yourself. Even if you are not a trained lifesaver however, you can help a drowning person by holding out a pole, oar, branch, or stick for him to catch hold of; by throwing him a lifeline; or by throwing him some buoyant object with which he can support himself in the water.

Various methods are used aboard ship to pick up survivors from the water. The method used in any particular instance will depend upon weather conditions, the type of equipment available aboard the rescue vessel, the number of men available for rescue operations, the physical condition of the men requiring rescue, and other factors. In many cases it has been found that the best way to rescue a person from the water is to send out a properly trained and properly equipped swimmer with a lifeline.

It is frequently difficult to get survivors up to the deck of the rescuing vessel, even after they have been brought alongside. Cargo nets are often used, but many survivors are unable to climb them without assistance. Men equipped with lifelines (and, if necessary, dressed in anti-exposure suits) can be sent over the side to help survivors up the nets. If survivors are covered with oil, it may take the combined efforts of four or five men to get one survivor up the net.

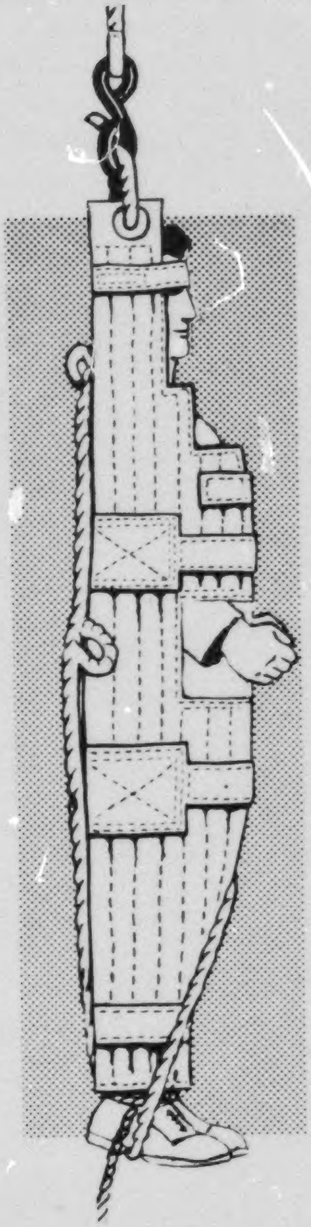
A seriously injured person should never, except in extreme emergency, be hauled out of the water by means of a rope or lifeline. Special methods must be devised which will provide proper support for him, keep him in a horizontal position, and protect him from any kind of jerking, bending, or twisting motion. The Stokes stretcher (described later in this chapter) can often be used to rescue an injured survivor. The stretcher is lowered into the water, and the survivor is floated into position over it. Men on the deck of the ship can then bring the stretcher up by means of handlines. Life preservers, balsa wood, unicellular material, or other flotation gear can be used if it is necessary to keep the stretcher afloat.

Moving the Casualty to Safety

In an emergency, you may have to hoist, carry, or drag an injured person away from a position of danger. In some instances you will be able to do this by means of the Neil Robertson stretcher, or by the use of improvised lifelines; in other cases you will have to move the casualty by using the fireman's carry, the tied-hands crawl, the blanket drag, the pack-strap carry, the chair carry, or some type of arm carry. Sometimes it is necessary to move him with all possible speed, without regard to the severity of his injuries. Remember, however, that when you move an injured person you are taking a calculated risk: YOU MAY KILL HIM BY MOVING HIM! You are justified in taking such a risk only when it is evident that he will die if you do not move him.

NEIL ROBERTSON STRETCHER.—The Neil Robertson stretcher is specially designed for the purpose of removing an injured person from engineroom spaces, holds, and other compartments where access hatches are too small to permit the use of regular stretchers.

The Neil Robertson stretcher is made of semirigid canvas. When firmly wrapped around the casualty mummy-fashion, it gives sufficient



136.37

Figure 11-2.–Neil Robertson Stretcher.

support so that he may be lifted vertically. (See fig. 11-2). Note that a guideline is tied to the casualty's ankles to keep him from swaying against bulkheads and hatchways while he is being lifted.

Stretchers of this type can be made on board ship, and kept in appropriate places ready for use. If a Neil Robertson stretcher is not available when needed, a piece of heavy canvas, wrapped firmly around the casualty, will serve somewhat the same purpose.

EMERGENCY RESCUE LINES.–As previously mentioned, the steel-wire lifeline can often be used to haul a person to safety. An emergency rescue line can also be made from any strong fiber line. Both should be used only in extreme emergencies, when an injured person must be moved and no other means is available.

Figure 11-3 shows an emergency rescue line which could be used to hoist a man from a void

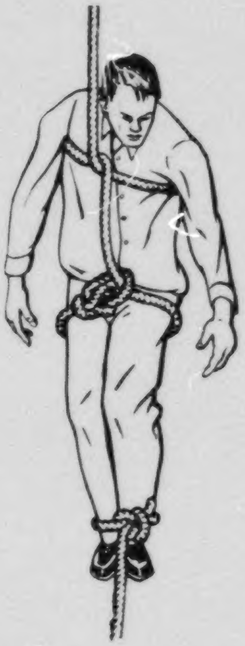


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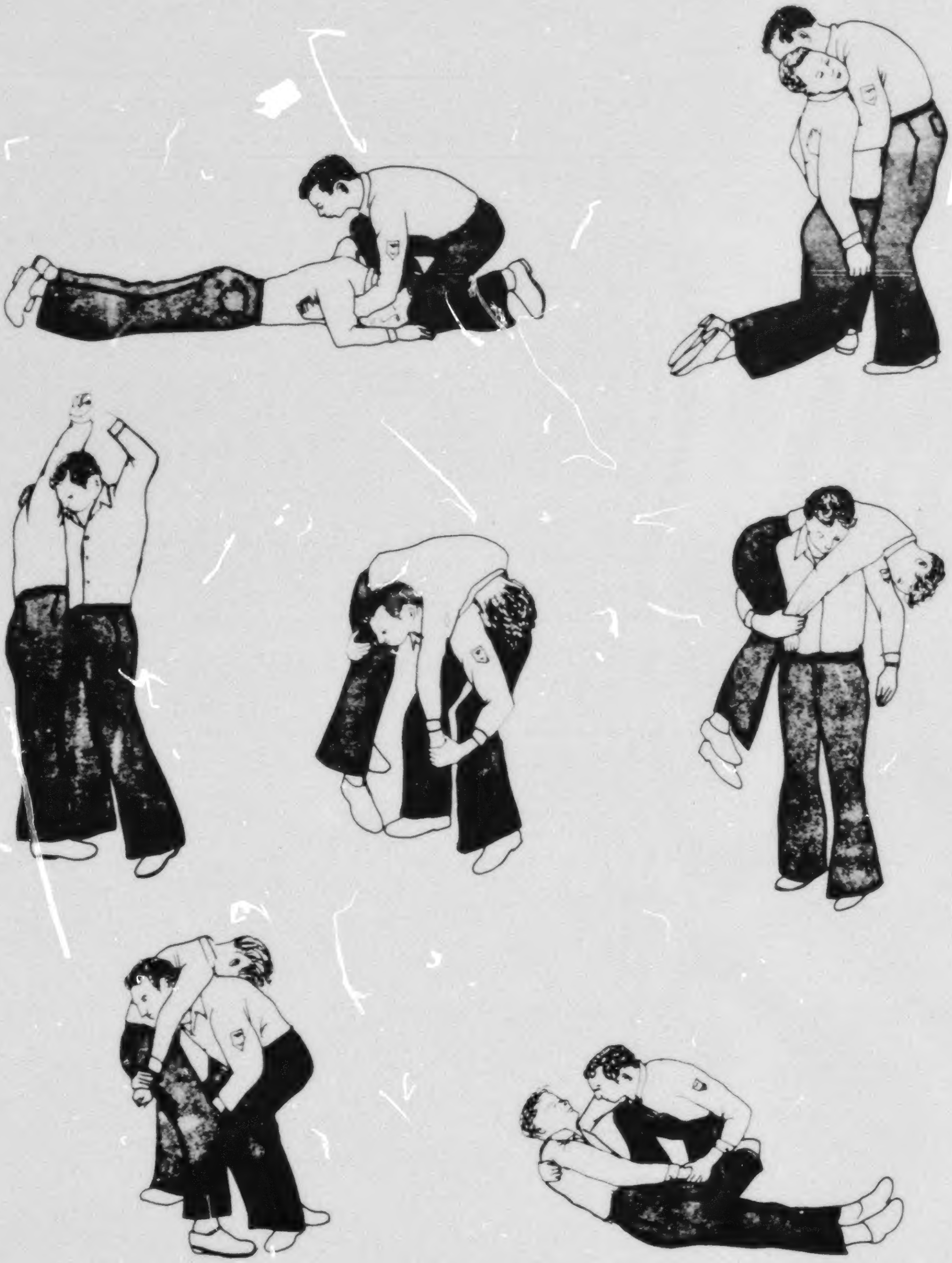
Figure 11-3.–Emergency Rescue Line.



136.39

Figure 11-4.—Fireman's Carry.

or small compartment. Notice that a running bowline is passed around the body, just below the hips, and a half hitch just under the arms. Notice also that a guideline is tied to the casualty's ankles to keep him from banging against bulkheads and hatchways.

FIREMAN'S CARRY.–One of the easiest ways to carry an unconscious person is by means of the fireman's carry. Figure 11-4 shows the procedure:

1. Turn the casualty so that he is lying flat, face down, as shown in figure 11-4(A). Kneel on one knee at his head, facing him. Pass your hands under his armpits; then slide your hands down his sides and clasp them across his back.

2. Raise the casualty to his knees, as shown in figure 11-4(B). Take a better hold across his back.

3. Raise the casualty to a standing position, and stick your right leg between his legs, as shown in figure 11-4(C). Grasp his right wrist in your left hand and swing his arm around the back of your neck and down your left shoulder.

4. Stoop quickly and pull the casualty across your shoulders and, at the same time, put your right arm between his legs, as shown in figure 10-4(D).

5. Grasp his right wrist with your right hand and straighten up, as shown in figure 11-4(E).

The procedure for lowering the casualty to the deck is shown in parts (F) and (G) of figure 11-4.

TIED-HANDS CRAWL.–The tied-hands crawl, shown in figure 11-5 may be used to drag an unconscious person for a short distance; it is particularly useful when you must crawl underneath a low structure.

To carry a person by this method turn him so that he is lying flat on his back. Cross his wrists and tie them together. Kneel astride the casualty and lift his arms over your head so that his wrists are at the back of your neck. When you crawl forward, raise your shoulders high enough so that the casualty's head will not bump against the deck.

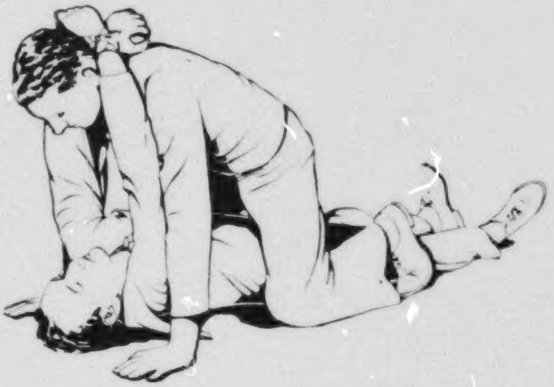


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Figure 11-5.–Tied-Hands Crawl.

BLANKET DRAG.–The blanket drag, shown in figure 11-6, can be used to move a person who is so seriously injured that he should not be lifted or carried by one man alone. Place the casualty on his back on a blanket, and pull the blanket along the floor or deck. Always pull the casualty head first, with his head and shoulders slightly raised, so that his head will not bump against the deck.

PACK-STRAP CARRY.–With the pack-strap carry, shown in figure 11-7, it is possible to carry a heavy person for some distance. Use the following procedures:

1. Place the casualty lying down, face up.

2. Lie down on your side along the casualty's uninjured or less injured side. Your shoulder should be next to his armpit.

3. Pull the casualty's far leg over your own, holding it there if necessary.

4. Grasp the casualty's far arm at the wrist and bring it over your upper shoulder as you roll and pull him onto your back.

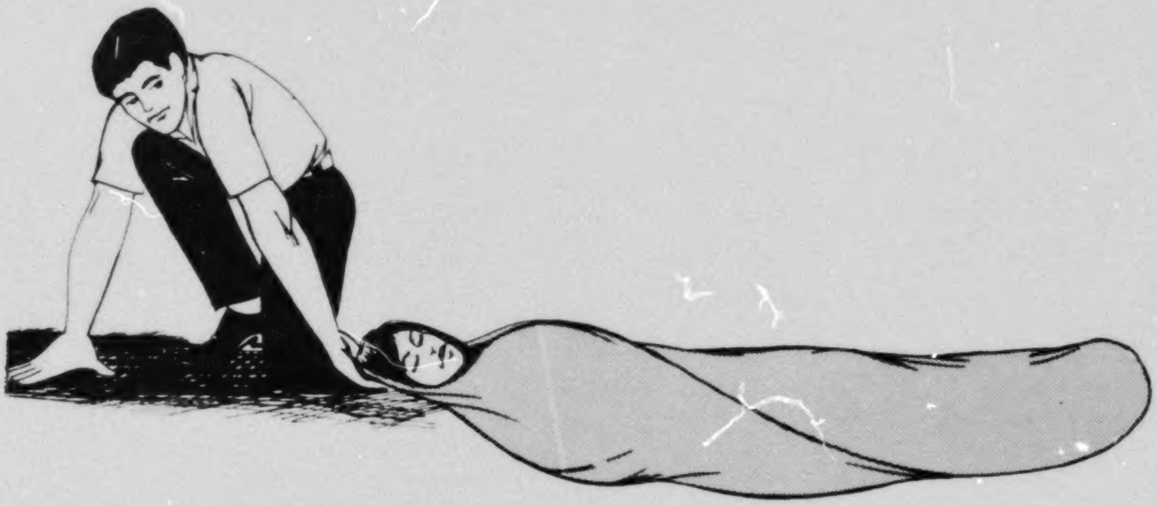
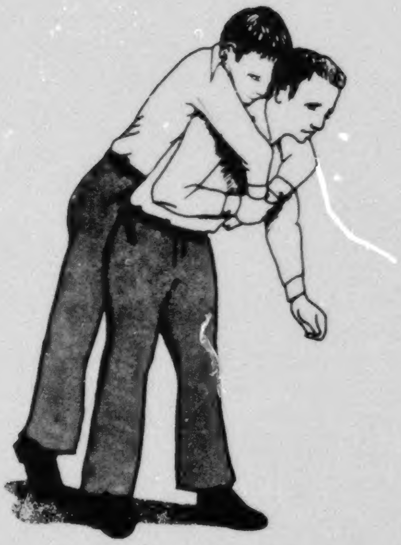


Figure 11-6.—Blanket Drag. 136.41



136.42
Figure 11-7.—Pack-Strap Carry.

5. Rise up on your knees, using your free arm for balance and support. Hold both of the casualty's wrists close against your chest with your other hand.

6. Lean forward as you rise to your feet, and keep both of your shoulders under the casualty's armpits.

Do not attempt to carry a seriously injured person by means of the pack-strap carry, especially if his arms, spine, neck, or ribs are fractured.

CHAIR CARRY.—The chair carry can often be used to move a sick or injured person away from a position of danger. The casualty is seated on a chair, as shown in figure 11-8, and the chair is carried by two men. This is a particularly good method to use when you must carry a person up or down stairs or through narrow, winding passageways. It must NEVER be used to move a person who has an injured neck, back, or pelvis.

ARM CARRIES.—There are several kinds of arm carries which can be used, in emergency

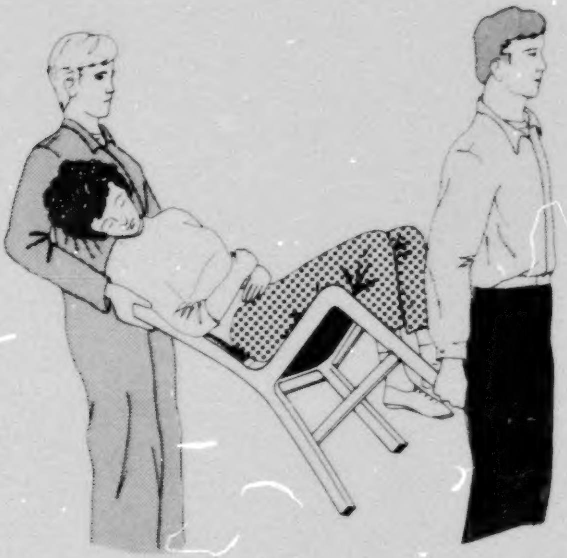


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Figure 11-8.—Chair Carry.

situations, to move an injured person to safety. Figure 11-9 shows how one person can carry the casualty alone. However, you should never try to carry a person this way if he is seriously injured. Unless he is considerably smaller than you are, you will not be able to carry him very far by this method.

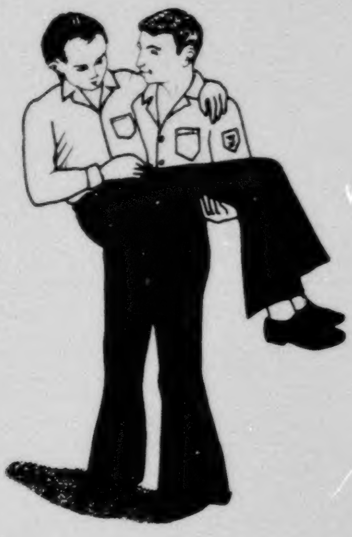

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Figure 11-9.—One-Man Arm Carry.

The two-man arm carry, shown in figure 11-10, can be used in some cases to move an injured person. However, it should not be used to carry a person who has serious wounds or broken bones.

Another two-man carry which can be used in emergencies is shown in figure 11-11. Two men kneel beside the casualty about at the level of his hips, and carefully raise him to a sitting position. Each man puts one arm under his thighs; hands are clasped and arms are braced as shown in figure 11-11(A). Both men then rise slowly and steadily to a standing position, holding the casualty as shown in figure 11-11(B). This carry must not be used to move seriously injured persons.

TRANSPORTATION OF THE INJURED

Thus far in this chapter, we have dealt with EMERGENCY methods used to get an injured person out of danger, into a position where he can receive first aid. As we have seen, these emergency rescue procedures often involve substantial risk to the casualty and should be used ONLY when clearly necessary.

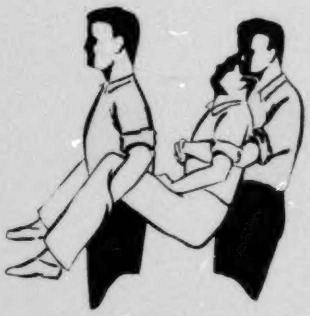

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Figure 11-10.—Two-Man Carry by Arms and Legs.

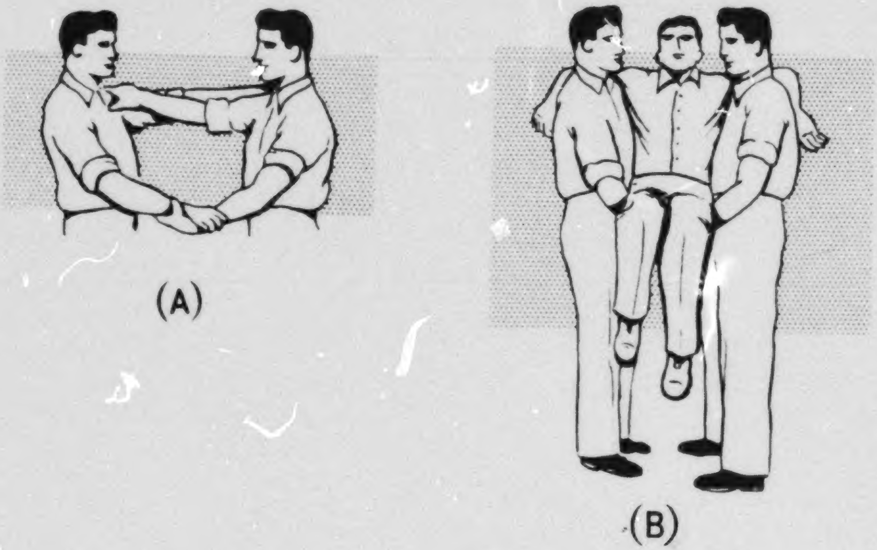

Figure 11-11.—Two-Man Arm Carry.

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Once you have rescued the casualty from the immediate danger which threatened him, SLOW DOWN! From this point on, handle and transport him with every regard for the injuries which he has sustained. In the excitement and confusion which almost always accompany an accident, you are likely to feel rushed, as though you must do everything rapidly. To a certain extent, this is a reasonable feeling to have: Speed is essential in treating many injuries, and in getting the casualty to a medical officer or hospital. However, it is NOT reasonable to let yourself feel so hurried that you handle him roughly or carelessly, or transport him in a way which will aggravate his injuries.

General Precautions

The basic precautions which must be observed in transporting an injured person may be summarized as follows:

1. Give necessary first aid BEFORE attempting to transport the casualty. Be sure that all injuries have been located. Treat serious breathing problems, bleeding, and shock, in that order. Immobilize all fractures, sprains, and dislocations. Do whatever you can to reduce the casualty's pain and to make him as comfortable as possible under the circumstances.

2. Use a regular stretcher, if one is available; if you must use an improvised stretcher, be sure that it is strong enough. Be sure, also, that you have enough men to carry the stretcher, so that you will not run any risk of dropping the casualty.

3. Whenever possible, bring the stretcher to the casualty instead of carrying him to the stretcher.

4. Fasten the casualty to the stretcher so that he cannot slip, slide, or fall off. Tie his feet together, unless he has injuries which make this impracticable.

5. Use blankets, garments, or other material to pad the stretcher and to protect the casualty from exposure.

6. As a general rule, an injured person should be lying on his back while he is being moved. However, in some instances the type or location of the injury will necessitate the use of another position. A person who is having difficulty in breathing because of a chest wound may be more comfortable if his head and shoulders are slightly raised. A person who has a broken bone should be moved very carefully, so that the injury will not be made worse. If the casualty has received a severe injury to the head, he should be kept lying on his side or on his back with his head turned to one side to prevent him from choking on saliva, blood or vomitus while being transported. In all cases, it is important to place him in the position which will best protect him from further injury.

7. The stretcher should be carried in such a way that the casualty will be moved FEET FIRST, so that the rear stretcher bearer can continually watch the victim for signs of breathing difficulty.

8. If you must use a motor vehicle to transport a seriously injured person, the best means is an ambulance; if no ambulance is available, however, a truck or station wagon makes a fairly good substitute. If it is necessary to use a passenger car to transport a seriously injured person, do not attempt to put him in the car until you have figured out the best place for him to be, without undue bending, twisting, or turning.

9. Do not turn the casualty over to anyone without giving a complete account of the situation. Be sure that the person taking over knows what caused the injury and what first aid treatment has been given. If a tourniquet has been applied, make sure that this is known to the person who is taking charge of the casualty.

Stokes Stretcher

The Navy service litter most commonly used for transporting sick or injured persons is called the Stokes stretcher. As shown in figure 11-12, the Stokes stretcher is essentially a wire basket supported by iron or aluminum rods. It is adaptable to a variety of uses, since the casualty can be held securely in place even if the stretcher is tipped or turned. The Stokes stretcher is particularly valuable for transferring injured persons to and from boats. As mentioned before, it can often be used to rescue injured survivors from the water. It is also used for direct ship-to-ship transfer of injured persons.

The Stokes stretcher should be padded with three blankets: two of them should be placed lengthwise, so that one will be under each of the casualty's legs, and the third should be folded in half and placed in the upper part of the stretcher to protect his head and shoulders. The casualty should be lowered gently into the stretcher, and made as comfortable as possible. His feet must be fastened to the end of the stretcher so that he

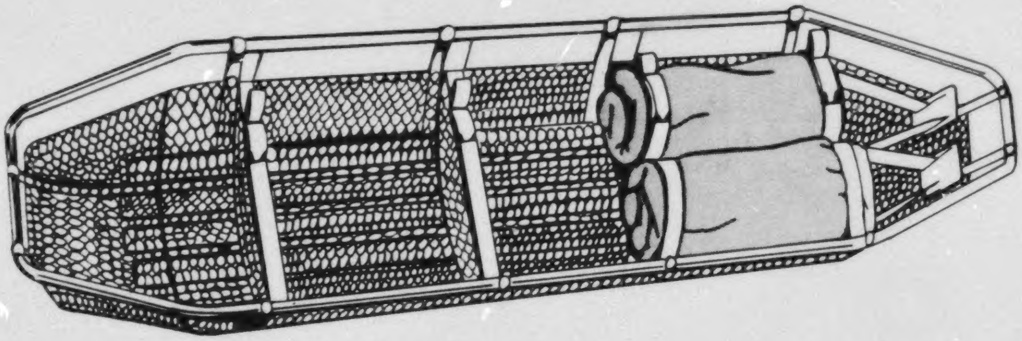

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Figure 11-12.—Stokes Stretcher.

will not slide up and down. Another blanket (or more, if necessary) should be used to cover him. The casualty must be fastened to the stretcher by means of straps which go over his chest, hips, and knees. Note that the straps go OVER the blanket or other covering, and thus hold it in place.

Army Litter

The Army litter, shown in figure 11-13, is a collapsible stretcher made of canvas and supported by wooden or aluminum poles. It is very useful for transporting battle casualties in the field. However, it is sometimes difficult to fasten the casualty onto the Army litter; and for this reason its use is somewhat limited aboard ship.

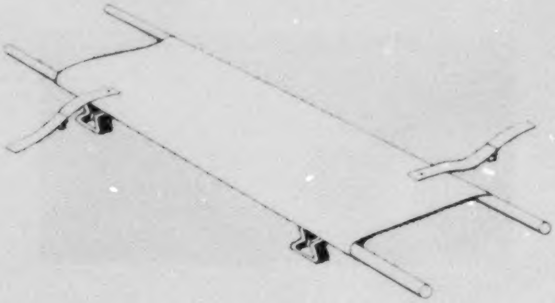

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Figure 11-13.—Army Litter.

Improvised Stretchers

The Stokes stretcher or the Army litter should be used, if possible, whenever it is necessary to transport a seriously injured person. If neither of these stretchers is available, it may be necessary for you to improvise some way of carrying the seriously injured.

Shutters, doors, boards, and even ladders may be used as stretchers. All stretchers of this kind must be very well padded; and great care must be taken to see that the casualty is fastened securely in place.

Sometimes a blanket may be used as a stretcher, as shown in figure 11-14. The casualty is placed in the middle of the blanket on his back. Three or four men kneel on each side, and roll the edges of the blanket toward the casualty

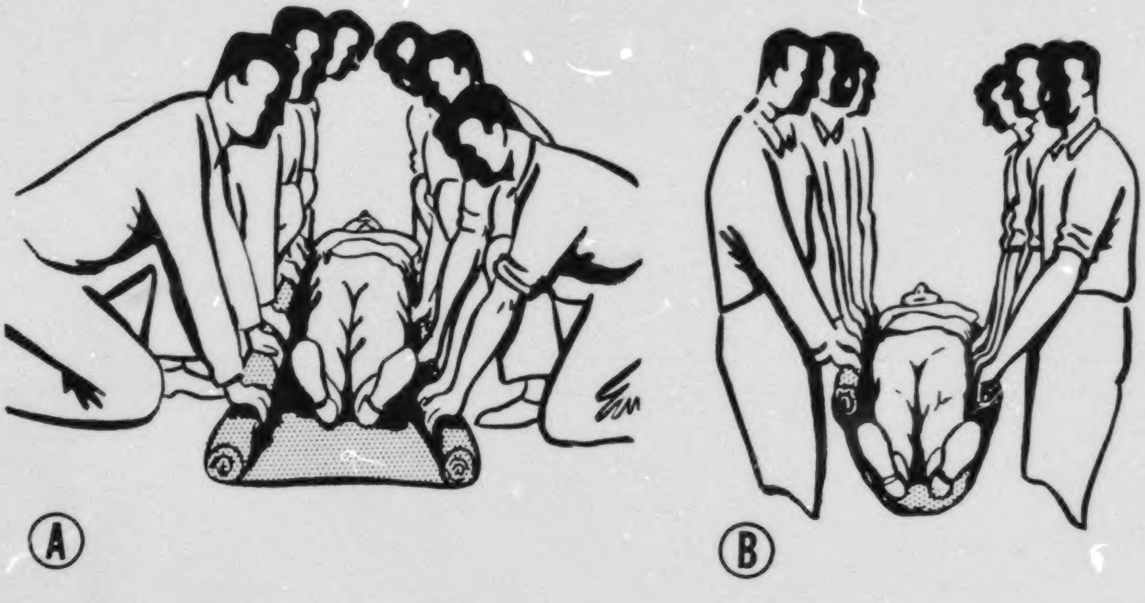

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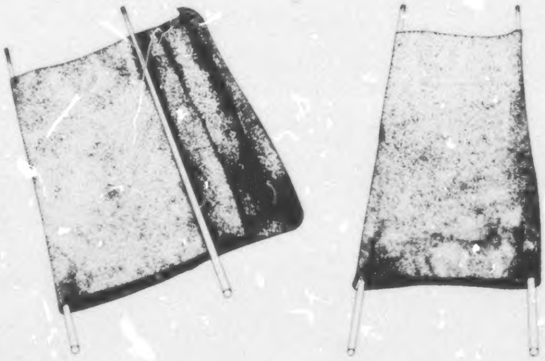
Figure 11-14.—Blanket Used as an Improvised Stretcher.

as shown in figure 11-14(A). When the rolled edges are tight and large enough to grasp securely, the casualty should be lifted and carried, as shown in figure 11-14(B).

Stretchers may also be improvised by using two long poles (about 7 feet long) and any strong cloth, such as a rug, a blanket, a sheet, a mattress cover, two or three gunny sacks, or two coats. Figure 11-15 shows an improvised stretcher made from two poles and a blanket.

CAUTION: Many improvised stretchers do not give sufficient support to be used in cases where there are fractures or extensive wounds of the body. They should be used only when the casualty is able to stand some sagging, bending, or twisting, without serious consequences.



136.50A

Figure 11-15.–Stretcher Made From Poles and a Blanket.

APPENDIX I

GLOSSARY

This glossary has been developed to assist the non-medic in interpreting the meaning of common medical terminology. To be of immediate assistance to the non-medic, the definitions have been made as brief and simple as possible. If more detailed definitions are required a standard medical dictionary should be consulted.

ABDOMEN–the belly. The area of the body that lies between the chest and pelvis.

ABSCESS–a swollen, inflamed area of body tissue in which pus collects.

ABSORBENT–having ability to soak up or take in another substance.

ACUTE–sharp and severe. A condition of rapid onset and short duration, as in pain or illness.

AIR PASSAGE–any of several tubes which transmit air from the nose or mouth to the lungs.

AIRTIGHT–preventing the passage of air.

AIRWAY–the route for passage of air and/or gases into and out of the lungs.

ANAPHYLACTIC SHOCK–a severe allergic reaction of the body to a foreign substance.

ANTIDOTE–a remedy or agent that neutralizes a poison.

ANTISEPTIC–an agent which prevents or slows down growth of disease-producing organisms. Free from contamination.

ANTITOXIN–a substance that works against a poison.

ANTIVENOM–an antitoxin against animal or insect venom.

APPENDAGE–a body part branching off from the trunk; for example, an arm or leg.

ARTERIAL PRESSURE–the pressure of the blood in the arteries.

ARTERY–a tube-like body structure which carries blood and oxygen from the heart.

ARTIFICIAL VENTILATION–movement of air into and out of the lungs by artificial means.

ASEPTIC–free from germs.

ASPHYXIATE–suffocate, smother.

ASPIRATION–to draw in or out. To suck in.

BLISTER–a small rounded elevation of skin, usually filled with fluid.

BLOOD POISONING–the presence of bacteria and toxic materials in the blood. Also referred to as septicemia.

BOIL–a red and swollen sore on the skin.

BUTTOCKS–two rounded, muscular areas at the back of the hips; the rump.

CAPILLARY–tiny tube-like vessels that connect veins and arteries.

CARBON MONOXIDE–a poisonous gas without color, taste, or odor.

CARBUNCLE–a red and swollen sore filled with pus, located on the skin surface, and extending into the deep body tissue.

CARTILAGE–a tough, elastic, connective tissue in the joint ends of bones, and the nose and ears.

CAUTERIZE–to burn or sear injured tissue.

CENTRAL NERVOUS SYSTEM (CNS)–the brain and spinal cord.

CHRONIC–long and drawn out.

CLAMMY–damp and cool.

CLAVICLE–the collarbone. Forms the front part of the shoulder; attaches to the top of the sternum (breastbone) and scapula (shoulder blade).

CLOT–a semisolid lump or mass formed by thickened blood.

COMA–a deep state of unconsciousness usually caused by disease, injury, or poison.

COMPRESS–a cloth wet or dry, applied to an injury, to control bleeding, or swelling.

COMPRESSION–to press together into a smaller space.

CONCUSSION–a jarring brain injury resulting from a head blow or fall.

CONSCIOUS–awake, aware, and responsive to stimuli or surroundings.

CONSTRICT–to make narrow, as when the pupil of the eye reacts to light.

CONTAGIOUS–catching. Transmitted from one person to another, either directly or indirectly.

CONTAMINATE–to introduce an impure substance into a clean or aseptic area; for example, dirt entering a wound. To infect.

CONTRACTION–shortening or tightening.

CONTRAINDICATION–a special condition which causes a normal treatment procedure to be improper or undesirable.

CONVULSION–an abnormal, violent, and involuntary contraction of the muscles. A fit or seizure that can be caused by poison, drugs, drug withdrawal, or epilepsy.

CYANOSIS–bluish discoloration of the skin from lack of oxygen in the blood.

DECOMPOSITION–decay.

DECONTAMINATE–to rid the body, clothes, room, linen, containers, etc., of anything that is dangerous or poisonous.

DEFORMITY–a bodily deviation from normal shape or size, resulting in distorted appearance.

DELIRIUM–a temporary mental disturbance characterized by confusion, excitement, disordered speech, and hallucinations.

DIAGNOSIS–recognition of a specific disease.

DIARRHEA–frequent passage of stools that have a more or less liquid consistency.

DILATE–to make wider or to expand, as when the pupil of the eye adjusts to darkness.

DILUTE–to make thinner by mixing with water or other liquids.

DIRECT PRESSURE–force applied directly on top of a wound to stop bleeding.

DISINFECTANT–a chemical that kills or stops the growth of bacteria and germs.

DISLOCATION–displacement of a bone in a joint so that joint surfaces do not make proper contact.

DISTENTION–stretched out. Inflated.

DRESSING–sterile gauze or bandage applied to a wound and fixed in position.

DYSPNEA–difficult or labored breathing.

EDEMA–a collection of fluid in the body tissues which causes swelling.

ELIMINATION–getting rid of the body's waste products.

EMBEDDED–surrounded closely.

ESOPHAGUS–the tube that carries food from the mouth and throat to the stomach.

EVAPORATE–to change from liquid to a gas or vapor.

EXHALATION–breathing out.

EXTENSION–a movement which straightens a limb.

EXTERNAL–pertaining to the outside.

EXTREMITY–an arm or leg. A body part branching off from the trunk.

FEMUR–the thighbone. The bone that extends from the pelvis to the knees–the longest and largest bone in the body.

FEVER–an elevation of body temperature above normal (98.6°F) (37°C).

FLEXION–the bending motion of a joint.

FLUSH–sudden redness of the skin; or to wash by pouring large amounts of water over an area.

FORCEPS–a tong-like instrument for holding or grasping skin, dressings, or instruments. Also used as tweezers for removing splinters and barbs.

FOREIGN OBJECT–not normally a part of the body.

FRACTURE–any break or crack in a bone.

FROTHY–bubbly or foamy.

GANGRENE–death of tissue generally associated with loss of blood supply, injury, or disease.

GASTRIC DISTENTION–enlargement of the stomach caused by trapped air.

GROIN–the region where the abdomen and thighs join.

HAIR FOLLICLE–the root of the hair.

HALLUCINATIONS–seeing, smelling, or hearing things that are not real or true.

HEMORRHAGE–internal or external bleeding.

HEMOTOXIC–poisonous to the blood.

HYPEREXTENSION–extension of an arm or leg beyond normal limits.

IMMOBILIZE–to make incapable of moving, as with a splint or cast.

IMPAIRMENT–sickness or injury.

IMPERMEABLE–not allowing passage of fluids.

IMPREGNATE–to soak, fill, or saturate.

IMPROVISE–to make from available materials, usually on the spur of the moment.

INCISION–a cut made by a sharp instrument.

INCOHERENT–not understandable.

INFECTION–invasion and multiplication of germs in the body, resulting in tissue damage.

INFLAMMATION–condition of the tissues involving pain, heat, redness, and swelling.

INGESTION–swallowing substances taken into the mouth.

INHALATION–breathing in.

INTERNAL–pertaining to the inside.

IRRIGATION–cleansing by washing and rinsing with water or other fluids.

LARYNX–voice box.

LISTLESS–having no desire to exert oneself.

LITTER–a stretcher for carrying sick or injured.

MICRO-ORGANISMS–bacteria or germs that are so small that they can be seen only through a microscope.

MUCOUS–resembling mucus.

MUCOUS MEMBRANE–the lining of the body cavities and passages which connect directly or indirectly to the exterior.

MUCUS–a thick, sticky fluid secreted by mucous membranes and glands.

NAUSEA–a sickness in the stomach which produces a feeling of a need to vomit.

NEUROTOXIC–poisonous to nerve cells.

NEUTRALIZE–to make harmless. To destroy effectiveness.

OINTMENT–a soft, oily substance having antiseptic and healing properties.

ORGANISM–any individual living thing.

PARALYSIS–temporary or permanent loss of feeling or ability to move.

PERFORATION–a hole or series of holes made through a substance.

PERITONITIS–inflammation of the internal membranes lining the abdominal cavity.

PHARYNX–throat.

PNEUMONIA–an inflammation of the lungs caused by viruses, germs, or physical and chemical agents.

POROUS–containing or being full of tiny holes.

POTABLE–water or liquid suitable for drinking.

POTENCY–power, strength.

PRESSURE POINT–areas of the body where arterial blood flow can be stopped by pressing an artery against a bone.

PROFUSE–in large amounts.

PRONE–lying face downward.

PROSTRATION–complete exhaustion.

PULSE–the throbbing of arteries caused by the beating of the heart.

PUNGENT–sharp and harsh in taste or odor, irritating.

PUPIL–the opening in the center of the eye through which light passes–necessary for vision.

RELAPSE–slipping back or getting worse.

RESPIRATORY OBSTRUCTION–a blockage in the breathing system that prevents it from functioning normally.

SCALP–the skin of the head, excluding face and ears.

SEIZURE–an attack (fit), such as convulsions, in which there is some loss of body control.

SEMICONSCIOUS–not fully awake or oriented to surroundings.

SHOCK–a generalized depression of all body functions which results in decreased blood flow.

SIGNS–indications of a victim's condition visible to the rescuer.

SKULL–the bony framework of the head.

SPASM–sudden, involuntary movement of a muscle or muscles which is usually associated with pain.

SPINAL CORD–the cord of nerve tissues extending from the brain down the length of the spine.

SPINE–the backbone.

SPINEBOARD–a device used primarily for transporting patients with suspected or actual spinal injuries.

SPLINT–any material used to immobilize, support, or protect an injured area.

STERILIZE–to destroy germs. To make free from bacteria.

STOOL–waste matter discharged from the large intestine.

STRETCHER–a litter on which a patient can be carried.

STUPOR–state of being less responsive or sensible.

SUBCUTANEOUS–just beneath the skin.

SUCTION–the act of drawing up or out.

SUPERFICIAL–at, on, or near the surface.

SUPINE–lying on the back with the face upwards.

SWATHE BANDAGE–a bandage that passes around the chest, used to hold an injured arm to the chest or immobilizing fractured ribs.

SYMPTOMS–indications of a victim's condition as stated by the victim.

TETANUS–a bacteria which can enter the body through dirty wounds. It causes muscle spasms, and rigid neck and jaw muscles (lockjaw), often resulting in death.

THORACIC–pertaining to the chest.

TISSUE–living cells formed into a body structure such as the muscles.

TOLERANCE–power to resist.

TOURNIQUET–a device that is twisted around an extremity to stop severe bleeding. Usually consists of a band of flat material. Used only when all other measures fail.

TOXIC–poisonous.

TOXIN–a poison.

TRACHEA–the windpipe.

TRACTION–the act of pulling or drawing something straight.

TRAUMA–a wound or injury that is violently produced.

TRIANGULAR BANDAGE–a piece of cloth cut in the shape of a right triangle, used as a sling for the arm and other bandaging purposes.

ULCERS–an open sore on the skin or mucous membrane which drains tissue fluid.

UNCONSCIOUS–unable to respond to stimulation–"out cold".

VACCINE–a prepared mixture of living or dead germs which assist the body in developing resistance to certain diseases.

VASCULAR–relating to blood vessels.

VEIN–a tube-like body structure which returns blood to the heart.

VENTILATION–the process of breathing in and out to supply the body with oxygen and remove carbon dioxide.

VIRUS–an organism that can cause infectious or communicable diseases.

VITAL SIGNS–measurable signs by which the physical state of an individual can be determined–usually includes the pulse, respiratory rate, blood pressure, and the level of consciousness.

WINDPIPE–the tube through which air passes from the throat to the lungs.

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STANDARD FIRST AID TRAINING COURSE

NAVEDTRA 10081-C

This course was developed by the Naval Health Sciences Education and Training Command, Bethesda, Maryland, for the Chief of Naval Education and Training.

This assignment booklet (including answer sheets) is a part of a training package containing the Training Manual and Nonresident Career Course.

Each assignment is made up of a series of items based on assignment readings in the textbook. At the beginning of each assignment, the specific text material that should be studied is listed. The answer sheets to be completed are enclosed as a separate package.

WHAT IS THE COURSE OBJECTIVE

While completing this nonresident career course, the student will demonstrate his understanding of course materials by correctly answering items on the following: the responsibilities of all naval personnel in emergency situations; the recognition and management of conditions requiring first aid intervention; the application of priority setting in administering basic first aid, and the prevention of further injury when providing first aid assistance.

WHO WILL ADMINISTER THE COURSE

Your nonresident career course may be administered by your command or, in the case of small commands, your course may be administered by the Naval Education and Training Program Development Center. Consult your division officer and follow the instructions stated below for local administration if your course is administered by your command. Follow the instructions for Naval Education and Training Program Development Center administration if your course will be administered by the Center. It is your responsibility to keep the administering activity informed of your present address.

TO GET THE MOST OUT OF THIS COURSE

If there is an errata sheet included with this course, make all indicated changes and corrections in the assignment booklet and textbook.

Study those pages of the textbook listed for each assignment. Pay particular attention to the illustrations as they give a lot of information in a small space.

When you have finished the required readings for an assignment, answer the items in the assignment booklet. Read each item carefully. Consult your textbook to help you select the best answer. You may discuss difficult points in this course with your division officer or shipmates. However, the answer that you select must be your own. Indicate your answer directly on the answer sheet by erasing the appropriate block.

You may find that some of the text contents has become obsolete since the text was written. However, since the course is based on the textbook, in answering items be sure to select the best answer from the information in the textbook. The obsolete matter in the textbook will be brought up to date when the text is revised.

Use only the designated answer sheet for each assignment. Follow the directions found on the answer sheet to determine the proper procedures for completing it.

To complete this course successfully, you must meet the following standards: If you are on active duty, the average of the grades earned on all assignments must be at least 3.2. If you are not on active duty, the average of the grades earned on all assignments in each creditable unit of the course must be at least 3.2. (See the Naval Reserve Retirement box on the next page for the retirement points evaluated for this course.)

WHEN THE COURSE IS ADMINISTERED BY YOUR COMMAND

Adhere as closely as possible to a schedule of completing at least one assignment per month. Unnecessary delay in completing the course may prevent you from becoming fully qualified to take the regularly scheduled fleet-wide competitive examination for advancement.

Before completing the answer sheet, fill in all blanks at the top of the answer sheet.

Submit your completed assignments to the officer administering your course. He will discuss with you any of the questions that you do not understand. When the entire course has been completed and a satisfactory grade attained, a notation to this effect should be made by your local Command in your service record. By this means you will be given credit for your work.

The Naval Education and Training Program Development Center does not issue letters of Satisfactory Completion to enrollees who have their courses administered by their own Command.

WHEN THE COURSE IS ADMINISTERED BY THE NAVAL EDUCATION AND TRAINING PROGRAM DEVELOPMENT CENTER

Follow as closely as possible to a schedule of completing at least one assignment per month; however, retain all the answer sheets until you have completed the course, then mail them to the Center. The Center will verify and record your scores. Remember that unnecessary delay in completing the course may, if you are a reservist, prevent you from earning enough retirement credits to complete a year of Satisfactory Federal Service. Reservists may submit their answer sheets upon completion of a creditable unit.

Answer sheets are not returned by the Center, but you will receive formal notification of your final grade for the course (or creditable unit of the course) by issuance of a letter of Satisfactory Completion. Keep the Center informed of your present address.

Fill in all blanks on the answer sheet. Unless you supply all the information required, it will be impossible to give you credit for your work. The textbook for the courses should NOT be returned to the Center.

NAVAL RESERVE RETIREMENT

This course is evaluated at 10 Naval Reserve retirement points. These points are creditable to personnel eligible to receive them under current directives governing retirement of Naval Reserve personnel.

Naval Reserve retirement credit will not be given for this course if the student has previously received retirement credit for another Standard First Aid Training Course.

While working on this nonresident career course, you may refer freely to the text. You may seek advice and instruction from others on problems arising in the course, but the solutions submitted must be the result of your own work and decisions. You are prohibited from referring to or copying the solutions of others, or giving completed solutions to anyone else taking the same course.

Naval nonresident career courses may include a variety of items -- multiple-choice, true-false, matching, etc. The items are not grouped by type; regardless of type, they are presented in the same general sequence as the textbook material upon which they are based. This presentation is designed to preserve continuity of thought, permitting step-by-step development of ideas. Some courses use many types of items, others only a few. The student can readily identify the type of each item (and the action required of him) through inspection of the samples given below.

MULTIPLE-CHOICE ITEMS

Each item contains several alternatives, one of which provides the best answer to the item. Select the best alternative and erase the appropriate box on the answer sheet.

SAMPLE

s-1. The first person to be appointed Secretary of Defense under the National Security Act of 1947 was
- a. George Marshall
- b. James Forrestal
- c. Chester Nimitz
- d. William Halsey

The erasure of a correct answer is indicated in this way on the answer sheet:

	a T	b F	c	d	
s-1	■	C	■	■	

TRUE-FALSE ITEMS

Determine if the statement is true or false. If any part of the statement is false the statement is to be considered false. Erase the appropriate box on the answer sheet as indicated below.

SAMPLE

s-2. Any naval officer is authorized to correspond officially with a bureau of the Navy Department without his commanding officer's endorsement.

The erasure of a correct answer is also indicated in this way on the answer sheet:

	a T	b F	c	d	
s-2	■	CC	■	■	

MATCHING ITEMS

Each set of items consists of two columns, each listing words, phrases or sentences. The task is to select the item in column B which is the best match for the item in column A that is being considered. Items in column B may be used once, more than once, or not at all. Specific instructions are given with each set of items. Select the numbers identifying the answers and erase the appropriate boxes on the answer sheet.

SAMPLE

In items s-3 through s-6, match the name of the shipboard officer in column A by selecting from column B the name of the department in which the officer functions.

A. Officers	B. Departments
s-3. Damage Control Assistant	1. Operations Department
s-4. CIC Officer	2. Engineering Department
s-5. Assistant for Disbursing	3. Supply Department
s-6. Communications Officer	

The erasure of a correct answer is indicated in this way on the answer sheet:

	a T	b F	c	d	
s-3	■	C	■	■	
s-4	C	■	■	■	
s-5	■	■	C	■	
s-6	C	■	■	■	

How To Score Your Immediate Knowledge of Results (IKOR) Answer Sheets

	a T	b F	c	d	
1	■	C	6	■	1
2	C	9	■	9	2
3	■	■	C	■	
4	CC	12	■	■	1

Total the number of incorrect erasures (those that show page numbers) for each item and place in the blank space at the end of each item.

Sample only

Number of boxes erased incorrectly	0-2	3-7	8-
Your score	4.0	[✓ 3.9]	3.8

Now TOTAL the column(s) of incorrect erasures and find your score in the Table at the bottom of EACH answer sheet.

NOTICE: If, on erasing, a page number appears, review text (starting on that page) and erase again until "C", "CC", or "CCC" appears. For courses administered by the Center, the maximum number of points (or incorrect erasures) will be deducted from each item which does NOT have a "C", "CC", or "CCC" uncovered (i.e., 3 pts. for four choice items, 2 pts. for three choice items, and 1 pt. for T/F items).

Assignment 1

Introduction; Basic Life Support; Hemorrhage; Shock

Textbook, NAVEDTRA 10081-C: Chapters 1 through 4

PART I

MULTIPLE-CHOICE ITEMS

LEARNING OBJECTIVE for items 1-1 and 1-2: Define first aid and its primary purpose.

1-1. First aid is the immediate action taken to
   a. treat the injured until medical help is available.
   b. supplement proper medical or surgical treatment
   c. preserve vitality and resistance to disease.
   d. rescue and transport the injured.

1-2. When administering first aid which condition should be treated first?
   a. The most painful
   b. The most life-threatening
   c. The most obvious
   d. Bleeding

LEARNING OBJECTIVE for items 1-3 through 1-7: Identify the general first aid rules that apply to the following injuries.

1-3. A basic rule of first aid states, "Keep the victim lying down, his head level with his body, until you have found out what kind of injury he has." Which of the following would warrant an exception to this rule?
   a. Respiratory failure
   b. Cardiac arrest
   c. Shortness of breath
   d. Traumatic amputation

1-4. Avoid moving injured victims until all injuries are identified to
   a. assist investigating authorities.
   b. prevent unnecessary pain.
   c. allow the victim to stabilize.
   d. prevent further injury.

1-5. Why is it advisable to remove some or all of a victim's clothing when determining what first aid measures to apply?
   a. To keep the victim from becoming overheated
   b. To prevent further damage to the clothing
   c. To use the clothing for padding, splints, and so forth
   d. To get a better idea of the extent of the injury

1-6. When is it acceptable for the first-aider to touch an open wound with his fingers?
   a. Only when absolutely necessary
   b. To remove a protruding foreign body
   c. To replace bulging abdominal organs
   d. Never

1-7. Why should an injured person be carried feet first when transported by litter?
   a. Being able to see where he is going will calm him.
   b. The litter bearer at the rear will be better able to observe the victim.
   c. The litter bearer at the rear can protect the victim from being hit by flying debris.
   d. The victim's body weight will be more equally distributed.

LEARNING OBJECTIVE for items 1-8 through 1-11: Identify the causes or substances responsible for many cases of respiratory failure.

1-8. Pilots at high altitudes may experience respiratory failure due to
   a. compression of the body.
   b. swelling of the mucous membranes.
   c. insufficient oxygen in the air.
   d. paralysis of the respiratory center.

1-9. Unventilated spaces, such as voids or double bottoms, frequently do not contain enough oxygen to support life. Another reason these places are dangerous is that they frequently
   a. contain poisonous gases.
   b. are excessively moist.
   c. are excessively dry.
   4. are below freezing temperature.

1-10. Which of the following is a colorless, odorless, tasteless chemical compound that is frequently the cause of respiratory failure?
   a. Carbonic acid
   b. Carbon tetrachloride
   c. Carbon dioxide
   d. Carbon monoxide

1-11. Electric shock or excessive amounts of alcohol may cause respiratory failure due to
   a. swelling of the mucous membranes in the throat.
   b. hemorrhage from the lungs.
   c. paralysis of the respiratory center.
   d. inability of the blood to carry oxygen.

LEARNING OBJECTIVE for item 1-12: Identify a recognizable symptom of airway blockage.

1-12. One of the most reliable indications of a blocked airway in a conscious person is
   a. an ability to speak.
   b. a compression accident.
   c. partially digested food in the mouth.
   d. cherry red skin color.

LEARNING OBJECTIVE for item 1-13: Give a justification for using the abdominal thrust maneuver.

1-13. The abdominal thrust maneuver is used to
   a. clear a loose denture obstruction.
   b. prevent the tongue from being swallowed.
   c. clear a lower air passage obstruction.
   d. provide a method of air exchange.

LEARNING OBJECTIVE for item 1-14: Identify the purpose of artificial ventilation.

1-14. The purpose of artificial ventilation is to
   a. prevent the tongue from being swallowed.
   b. provide a method of air exchange.
   c. clear an upper air passage obstruction.
   d. clear a lower air passage obstruction.

LEARNING OBJECTIVE for item 1-15: Identify a method of manually removing an upper airway obstruction.

1-15. A first aid procedure for manually clearing an upper airway obstruction is
   a. slapping the victim on the back between the kidneys.
   b. placing the victim in a sitting position with his head forward.
   c. tilting the victim's head forward with the chin down.
   d. attempting to remove the obstruction with the fingers.

LEARNING OBJECTIVE for item 1-16: Identify the method of ventilatory assistance for victims with mouth injuries.

1-16. How would you give artificial ventilation to a patient with a badly swollen tongue?
   a. With an oxygen mask
   b. By the arm lift-back pressure method
   c. Mouth-to-mouth
   d. Mouth-to-nose

LEARNING OBJECTIVE for item 1-17: Identify a common complication of mouth-to-mouth ventilation.

1-17. When relieving gastric distention during artificial ventilation, what problem should you anticipate?
   a. Gas
   b. Vomiting
   c. Internal bleeding
   d. Cardiac arrest

LEARNING OBJECTIVE for item 1-18: Identify the location of the artery of choice for finding a pulse in an unconscious person.

1-18. The best artery for finding a pulse in an unconscious person is located in the
   a. arm.
   b. leg.
   c. neck.
   d. shoulder.

LEARNING OBJECTIVE for items 1-19 and 1-20: Identify the recommended positioning of the victim and the first-aider when administering CPR.

1-19. When giving mouth-to-mouth artificial ventilation, you place the victim on his
   a. back.
   b. abdomen
   c. right side.
   d. left side.

1-20. When giving closed chest massage to an adult, keep your elbows straight because
- a. this position is less fatiguing.
- b. it is more difficult to judge pressure with bent elbows.
- c. this allows you to use your weight to the best advantage.
- d. bending the elbows increases the incidence of rib fractures.

LEARNING OBJECTIVE for items 1-21 and 1-22: Identify the ventilation-compression ratio recommended for one and two rescuer techniques.

1-21. When one rescuer performs CPR, the ratio of ventilations to compressions is
- a. 2 to 15.
- b. 4 to 15.
- c. 15 to 2.
- d. 60 to 80.

1-22. When two rescuers perform CPR, the ratio of compressions to ventilations is
- a. 1 to 5.
- b. 5 to 1.
- c. 15 to 2.
- d. 60 to 80.

PART II

TRUE-FALSE ITEMS

Items 1-23 through 1-31 concern basic life support material. Answer them TRUE or FALSE.

1-23. All living cells of the body require oxygen to survive.

1-24. A grayish-blue skin color is one sign of inadequate breathing.

1-25. For both mouth-to-mouth and mouth-to-nose resuscitation, the patient's mouth should be open on exhalation.

1-26. The carotid pulse is located in the wrist.

1-27. For CPR to be performed correctly, the patient must be on a firm surface, such as the ground or spineboard.

1-28. In performing CPR, the rescuer's hands are located on the upper half of the sternum.

1-29. In performing CPR, the heel of one hand is placed on the heel of the other, with fingers raised so that no contact is made with the ribs.

1-30. The sternum of an adult should be compressed about 1-1/2 inches.

1-31. CPR can be performed by one rescuer.

PART III

MULTIPLE-CHOICE ITEMS

LEARNING OBJECTIVE for item 1-32: Identify the amount of blood loss that can precipitate shock.

1-32. A person usually goes into shock when he loses ________ of blood.
- a. 1/2 liter
- b. 2 liters
- c. 1 pint
- d. 2 pints

LEARNING OBJECTIVE for items 1-33 through 1-36: Identify physiological and physical characteristics of the vascular system.

1-33. The arteries of the body carry blood directly from the
- a. veins to the heart.
- b. capillaries to the veins.
- c. heart to the capillaries.
- d. heart to the veins.

1-34. Which of the following indicates capillary hemorrhage?
- a. Even flow of dark red blood
- b. Intermittent flow of dark red blood
- c. Spurting flow of brick red blood
- d. Slow oozing of brick red blood

1-35. Venous bleeding can be identified by its characteristic ________ red blood.
- a. dark
- b. brick
- c. bright
- d. light

1-36. Arterial bleeding is recognized by which of the following characteristics?
- a. Dark red color and spurting flow
- b. Bright red color and spurting flow
- c. Dark red color and steady flow
- d. Bright red color and steady flow

LEARNING OBJECTIVE for items 1-37 and 1-38: Identify the method of choice for controlling bleeding.

1-37. Which of the following methods would you use first to control bleeding?
- a. Tourniquet
- b. Direct pressure
- c. Indirect pressure
- d. Pressure on the pressure joints

1-38. How is direct pressure applied to control bleeding?
- a. By a compress and pressure on the wound
- b. By a compress and a tourniquet on the wound
- c. By manual pressure at the appropriate pressure point
- d. By a tourniquet at the appropriate pressure point

LEARNING OBJECTIVE for items 1-39 and 1-40: Identify an alternative to direct pressure as a method of controlling hemorrhage.

1-39. If direct pressure fails, what should be tried next to control hemorrhage?
- 1. Apply a tourniquet below the wound.
- 2. Elevate the bleeding part.
- 3. Apply pressure to the appropriate pressure point.
- 4. Apply a tourniquet above the wound.

1-40. What is a pressure point?
- a. A point where the blood pressure drops low enough to stop bleeding
- b. A place where the artery is protected on all sides by bone and muscle
- c. A place where an artery is close to the skin surface and over a bone
- d. A point where an artery is near the wound

LEARNING OBJECTIVE for items 1-41 through 1-47: Identify the number, location, and purpose of using specific pressure points.

1-41. There are ____ pressure points where digital pressure may be applied to control bleeding.
- a. 2
- b. 11
- c. 20
- d. 22

1-42. The pressure point located in a notch on the lower edge of the jawbone is used to stop bleeding
- a. from the neck.
- b. in the region of the temple or the scalp.
- c. on the face below the level of the eyes.
- d. from the eyes.

1-43. Bleeding from the hand usually is controlled by pressure applied on the
- a. inside of the elbow.
- b. middle of the lower arm.
- c. middle of the upper arm.
- d. wrist.

1-44. Apply digital pressure on the inner side of the arm, about halfway between the shoulder and the elbow, to stop bleeding from the
- a. elbow.
- b. forearm.
- c. wrist.
- d. hand.

1-45. To control bleeding of the shoulder or the upper arm, apply digital pressure to the
- a. area just in back of the prominent neck muscle.
- b. area just in front of the prominent neck muscle.
- c. back of the collarbone.
- d. front of the collarbone.

1-46. Digital pressure is applied in the middle of the groin to control bleeding from the
- a. foot.
- b. ankle.
- c. knee.
- d. thigh.

1-47. Pressure applied at the back of the knee controls bleeding
- a. at the ankle.
- b. between the knee and the foot.
- c. in the ankle or foot.
- d. between the knee and the body.

LEARNING OBJECTIVE for items 1-48 and 1-49: Identify a control and a precautionary measure for managing a bleeding neck wound.

1-48. To control arterial bleeding in the neck
- a. pack the area with ice.
- b. apply a firm pressure dressing.
- c. elevate the head and shoulders.
- d. apply digital pressure to the carotid artery.

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1-49. Great care should be taken when applying digital pressure to a neck wound because it

a. increases pressure in the brain.
b. prevents blood return from the brain.
c. can interfere with normal breathing.
d. interferes with the oxygen supply to the brain.

LEARNING OBJECTIVE for item 1-50: Identify a disadvantage of digital pressure in controlling severe hemorrhage.

1-50. Why should the digital pressure method be substituted with another method as soon as possible?

a. It is very tiring for the first-aider
b. It is very uncomfortable to the victim.
c. It is not very effective.
d. It is dangerous.

LEARNING OBJECTIVE for items 1-51 through 1-57: Identify the indication and criteria for using a tourniquet to control bleeding.

1-51. Use a tourniquet to stop bleeding from the

a. trunk.
b. neck.
c. extremities.
d. head.

1-52. Use a tourniquet only if

a. there is severe hemorrhage.
b. bleeding cannot be controlled by direct pressure.
c. bleeding cannot be controlled by pressure at the appropriate pressure point.
d. bleeding cannot be controlled by any other means.

1-53. Which of the following objects could be used as a band in an improvised tourniquet?

a. Rope
b. String
c. Stockings
d. Wire

1-54. When it becomes necessary to apply a tourniquet, place it between the wound and the body, and ensure that it is

a. well away from the wound, and as tight as possible without causing severe pain.
b. well away from the wound, and only tight enough to stop bleeding.
c. as close to the wound as practicable and as tight as possible without causing severe pain.
d. as close to the wound as practicable and only tight enough to stop bleeding.

1-55. A tourniquet must be tight enough to

a. stop nervous impulses.
b. stop arterial bleeding.
c. cause the limb to swell.
d. cause the limb to turn pale.

1-56. If a tourniquet has been applied, but medical help is not expected to arrive for a long time, what should be done about the tourniquet?

a. Leave it in place and do not loosen it.
b. Loosen it if the bleeding appears to stop.
c. Loosen it every 20 minutes.
d. Loosen it every 2 hours.

1-57. Immediately after applying a tourniquet,

a. cover the wound with a dressing.
b. attach a medical tag to the victim's wrist.
c. cover the tourniquet with a dressing.
d. loosen the tourniquet gradually over a period of 1 hour.

LEARNING OBJECTIVE for items 1-58 through 1-60: Identify first aid actions for actual or suspected hemorrhage victims.

1-58. A person suspected of bleeding internally should always receive first aid treatment aimed at preventing

a. hysteria.
b. shock.
c. respiratory failure.
d. cardiac arrest.

1-59. A person who has lost a large amount of blood should be treated for

a. respiratory failure.
b. cardiac arrest.
c. anemia.
d. shock.

1-60. Keeping a hemorrhaging patient quiet will encourage

a. rational behavior from the first-aider.
b. other victims to remain calm.
c. formation of a clot in the wound.
d. natural cleansing of the wound.

LEARNING OBJECTIVE for item 1-61: Identify the broad definition of shock.

1-61. Shock is defined as a condition in which there is

a. too much carbon dioxide in the blood.
b. too little oxygen in the blood.
c. complete stoppage of blood flow.
d. disturbance of the blood flow.

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LEARNING OBJECTIVE for item 1-62: Identify the variables that influence the development of shock.

1-62. Which of the following statements regarding shock is correct?
   a. Race has a significant influence on the incidence of shock.
   b. Women are more susceptible to shock than men.
   c. Resistance to shock is highly individual.
   d. Young children have high resistance to shock.

LEARNING OBJECTIVE for items 1-63 and 1-64: Identify symptoms of shock.

1-63. What are the signs of shock?
   a. Skin hot and dry, pupils dilated, pulse rapid and weak
   b. Skin hot and dry, pupils constricted, pulse slow and strong
   c. Skin moist and clammy, pupils dilated, pulse rapid and weak
   d. Skin moist and clammy, pupils constricted, pulse slow and strong

1-64. A victim in shock often feels __________, his skin is __________, and feels cold and ___________.
   a. weak, pale, moist
   b. weak, bluish, dry
   c. strong, bluish, moist
   d. strong, pale, dry

LEARNING OBJECTIVE for item 1-65: Identify negative change in shock condition.

1-65. If a person in shock becomes less responsive, he may be
   a. improving.
   b. worsening.
   c. sleeping.
   d. relaxed.

LEARNING OBJECTIVE for items 1-66 through 1-68: Identify correct first aid methods of treating shock.

1-66. In the absence of vomiting, liquids can be given by mouth to a conscious person in shock if he
   a. complains of severe thirst.
   b. has been seriously burned.
   c. is bleeding externally.
   d. is in severe pain.

1-67. Which of the following liquids should never be given to a patient in shock, or in a condition that could lead to shock?
   a. Alcohol
   b. Coffee
   c. Tea
   d. Water

1-68. Because conserving body heat is important in treating shock, which of the following are recommended to ensure adequate heat conservation?
   a. Hot water bottles
   b. Heating pads
   c. Dry blankets
   d. Electric blankets

PART IV

TRUE-FALSE ITEMS

Items 1-69 through 1-75 concern hemorrhage and shock. Answer them TRUE or FALSE.

1-69. Direct pressure over a wound stops most bleeding.

1-70. Elevating an extremity may help control bleeding from it.

1-71. The signs of internal bleeding are similar to those of shock.

1-72. A patient with severe internal bleeding may have moist, cool skin.

1-73. A person in shock may feel no pain, even though there are obvious injuries.

1-74. If you find an unconscious person, put him in a car and get him immediately to a hospital.

1-75. A person in shock should be kept lying down and warm.

Assignment 2

Wounds; Fractures; Dislocations; Sprains

Textbook, NAVEDTRA 10081-C: Chapters 5 and 6

PART I

MULTIPLE-CHOICE ITEMS

LEARNING OBJECTIVE for items 2-1 through 2-4: Identify some aspects in determining wound care priorities.

2-1. The two major problems of injuries resulting in a break in the skin are
- a. serious bleeding and loss of function.
- b. infection and disfigurement.
- c. infection and serious bleeding.
- d. changes in function and appearance.

2-2. The order of priorities in treating fresh wounds is
- a. treat infection, stop hemorrhage, apply dressing.
- b. stop hemorrhage, treat infection, apply dressing.
- c. remove foreign body and prevent infection.
- d. stop hemorrhage, prevent infection, apply dressing.

2-3. What type of wound requires a warm wet dressing?
- a. A fresh wound
- b. An infected wound
- c. An avulsion wound
- d. A large wound

2-4. Small wounds are sometimes more dangerous than large ones because they
- a. bleed more freely.
- b. become infected more easily.
- c. more often result in shock.
- d. cause greater tissue damage.

LEARNING OBJECTIVE for items 2-5 through 2-10: Identify the characteristics of four types of general wounds.

2-5. A cut differs from a laceration in that it has
- a. ragged edges.
- b. masses of torn material.
- c. blood vessels cut straight across.
- d. foreign bodies embedded in tissue.

2-6. Which of the following wounds are least likely to become infected?
- a. Abrasions
- b. Incisions
- c. Punctures
- d. Lacerations

2-7. Which of the following objects are most likely to cause lacerations?
- a. Dull knife
- b. Bullet
- c. Razor blade
- d. Nail

2-8. Which of the following wounds are most likely to become severely infected?
- a. Abrasions
- b. Incisions
- c. Punctures
- d. Lacerations

2-9. "Lockjaw" is a life-threatening complication of tetanus which is caused by
- a. a "dirty wound."
- b. drinking impure water.
- c. a fractured jaw.
- d. a convulsive seizure.

2-10. How can tetanus "lockjaw" be prevented?
- a. Keep up with your "shots."
- b. Be certain of your water sources, especially in the field.
- c. Avoid walking barefoot.
- d. Keep physically fit.

LEARNING OBJECTIVE for items 2-11 through 2-18: Identify the aspects of recognition, prevention, treatment, and complications of general wounds.

2-11. Why is it helpful to know the cause of a fresh wound?
- a. To know what kind of stitches are needed.
- b. To anticipate what infection may occur.
- c. To determine the method of evacuation.
- d. To know what problems to guard against.

2-12. Infection of minor wounds can usually be prevented if first aid treatment consists of
- a. oral administration of antibiotics.
- b. immediately wiping the wound with alcohol.
- c. vigorously washing the wound with soap and water.
- d. a penicillin shot.

2-13. What is the correct first aid for large wounds?
- a. Wash it with soap and water and let it dry.
- b. Cover it with a dry sterile compress.
- c. Flood it with water and let it dry.
- d. Cover it with a warm wet compress.

2-14. Tetanus is most likely to develop in a wound caused by
- a. an incision.
- b. an animal bite.
- c. a laceration.
- d. a puncture.

2-15. A serious disease carried in the saliva of infected animals is called
- a. lockjaw.
- b. rabies.
- c. tetanus.
- d. convulsions.

2-16. A victim of an animal attack must be seen by medical personnel as soon as possible if
- a. his skin is broken.
- b. the animal was wild.
- c. the animal was drooling.
- d. the animal bit or scratched him.

2-17. What is the immediate local treatment for an animal bite?
- a. Wash it with a mild chemical disinfectant.
- b. Leave it exposed to the air.
- c. Wash it with soap and sterile water.
- d. Burn each break in the skin with a hot needle.

2-18. After a person has been bitten by an animal, every effort should be made to
- a. kill the animal.
- b. examine the animal's blood.
- c. catch the animal alive.
- d. scare the animal off.

LEARNING OBJECTIVE for items 2-19 through 2-26: Identify the management of wounds that have foreign bodies.

2-19. What is the general rule concerning first aid for wounds containing foreign bodies?
- a. Attempt to remove all exposed foreign material near the surface.
- b Never remove deeply buried or widely scattered foreign bodies.
- c. If no exit wound is present, search for and remove all bullets, buckshots, and so forth.
- d. Remove deeply embedded material to prevent infection.

2-20. What would you do about the initial bleeding that occurs while removing a foreign object from a superficial wound?
- a. Encourage it by applying gentle pressure.
- b. Arrest it by applying a pressure dressing.
- c. Ignore it as it will eventually clot.
- d. Cauterize it with a direct heat source.

2-21. Which of the following is a recommended step in removing a foreign object from under a fingernail?
- a. Gently pry and dig the object out with a knife.
- b. Allow the area to fester and then squeeze it out.
- c. Soak the finger in warm, soapy water four times a day.
- d. First expose the object by cutting a V-shaped notch in the nail.

2-22. Because of the possible damage to the eyeball and vision, foreign objects embedded in the eye must be
- a. immediately removed and a pressure dressing applied.
- b. removed by gently probing with a sterile needle.
- c. displaced by having the victim pull the eyelid down and blowing his nose.
- d. removed by medical personnel only.

2-23. What is the first thing you should do for a person who has a foreign object on the surface of the eye?
- a. Have the victim try to rub it out.
- b. Attempt to blow it out.
- c. Gently wash the eye with lukewarm water.
- d. Close both eyes and apply a loose bandage over both.

2-24. How do you wash an object out of the eye?
- a. By directing the flow of liquid directly onto the eyeball.
- b. By letting the liquid flow from the center outward.
- c. By dropping liquid at the inside corner of the eye.
- d. By letting the liquid flow from the outside corner to the inside corner.

2-25. If you are unable to remove a superficial object from the eye by washing it, what should you do next?
- a. Attempt to remove it with the corner of a handkerchief.
- b. Attempt to remove it with a dry cotton swab.
- c. Pick it out with tweezers or forceps.
- d. Have the victim blink vigorously for several minutes.

2-26. If you are unable to locate a foreign body in the eye by pulling down the lower lid, you
- a. wash the eye with sterile water.
- b. cover the eye with a bandage.
- c. turn the upper lid back.
- d. wash the eye with boric acid solution.

LEARNING OBJECTIVE for item 2-27: Identify the function of a specific eye dressing.

2-27. Cover both of the victim's eyes when applying a dressing over a lacerated eyeball to
- a. relieve pressure on the injured eye.
- b. minimize eye movements.
- c. prevent cross infection between eyes.
- d. avoid strain on the uninjured eye.

LEARNING OBJECTIVE for items 2-28 through 2-30: Identify special wound care for cases of avulsion or amputation.

2-28. The life of avulsed tissue is prolonged by wrapping it in a cool moist towel. Why is it important for a first-aider to know this?
- a. Some religions require burial for tissues.
- b. This tissue can be used in research.
- c. Such tissue can often be surgically reattached.
- d. This tissue can be donated to others.

2-29. An important medical consideration when giving first aid to a victim of avulsion or traumatic amputation **is**
- a. shock.
- b. embedded foreign objects.
- c. contusions.
- d. sprains.

2-30. To control bleeding in a victim with a traumatic amputation, use
- a. a tourniquet.
- b. a pressure dressing.
- c. the pressure points.
- d. direct pressure.

LEARNING OBJECTIVE for items 2-31 through 2-35: Identify the principles of management for chest wounds.

2-31. The basic steps in treating severe chest wounds, in order of priorities, are:
- a. ensure breathing, stop hemorrhage, treat for shock.
- b. stop hemorrhage, prevent infection, treat for shock.
- c. treat for shock, prevent infection, stop hemorrhage.
- d. treat for shock, ensure breathing, prevent infection.

2-32. Which of the following is considered the most serious chest injury, requiring immediate first aid?
- a. Cracked or fractured ribs
- b. A hole in the chest cavity
- c. Spontaneous lung collapse
- d. Lung infection

2-33. The primary consideration in treating a sucking chest wound is
- a. controlling the bleeding.
- b. stopping the air leak.
- c. treating for shock.
- d. preventing infection.

2-34. What precaution must be taken when sealing off a sucking chest wound?
- a. Material used must be large enough so it is not sucked into the wound during breathing.
- b. Material used must be sterile so as not to cause a lung infection.
- c. Adhesive tape must not be used since the victim may be allergic to it.
- d. An immobilizing bandage must be applied to ensure an airtight seal.

2-35. After sealing a sucking chest wound,
- a. place the victim in the shock position.
- b. give cardiac massage.
- c. give artificial ventilation.
- d. given the victim oxygen, if available.

LEARNING OBJECTIVE for items 2-36 through 2-40: Identify the principles of management of abdominal wounds.

2-36. What position is best for the victim with an abdominal wound when the intestine is exposed?
- a. Lying on the back, knees drawn up
- b. The basic shock position
- c. A high sitting position
- d. Lying on the side, legs drawn up

2-37. Which should be tried first to stop severe bleeding from an abdominal wound?
- a. Pressure at pressure point
- b. Direct pressure
- c. Shock position
- d. Ice packs

2-38. If the intestine is exposed, cover the abdominal wound with a
- a. dry, sterile dressing.
- b. sheet of plastic or plastic wrap.
- c. compress moistened by alcohol.
- d. compress moistened by potable water.

2-39. Management of abdominal wounds with protruding intestines consists in
- a. applying a bandage to hold the wet compress in place.
- b. wrapping several small, wet compresses around the intestinal tubes.
- c. covering the intestines with any material available to keep them dry.
- d. putting a tourniquet around any part of the intestines that is bleeding severely.

2-40. Since victims with large abdominal wounds lose large amounts of body fluids, first aid care is aimed at
- a. relieving severe thirst.
- b. preventing breathing problems.
- c. limiting urination.
- d. preventing shock.

LEARNING OBJECTIVE for items 2-41 through 2-46: Identify the principles of management of face, head, and internal wounds.

2-41. When observing a victim with a head injury, watch closely for
- a. confusion.
- b. hysteria.
- c. vomiting.
- d. blindness.

2-42. What emergency is likely to develop in a victim whose lower jaw has been severely injured?
- a. An airway obstruction
- b. Facial disfigurement
- c. A severe infection
- d. Chewing problems

2-43. First aid treatment for a bleeding eyelid includes applying a sterile compress and a
- a. firm bandage to both eyes.
- b. firm bandage to the injured eyelid.
- c. loose bandage to both eyes.
- d. loose bandage to the injured eyelid.

2-44. What position is recommended for transporting a victim with a facial wound that involves the eyes?
- a. Sitting
- b. Standing
- c. Flat on the back
- d. Shock position

2-45. What significant body damage is commonly caused by the detonation of explosives?
- a. Permanent hearing problems
- b. Temporary vision problems
- c. Mental confusion
- d. Internal injuries

2-46. When administering first aid to a victim suspected of having internal injuries, keep in mind that
- a. any movement may make the injury worse.
- b. movement that increases blood circulation decreases the severity of shock.
- c. absence of observable bleeding points to a minor injury.
- d. there is little hope of saving the victim's life.

LEARNING OBJECTIVE for items 2-47 and 2-48: Identify the factors influencing infection in wounds.

2-47. In what area of the body can minor infections spread quickly to the bloodstream and cause brain infections?
- a. Nose and mouth
- b. Around the ear lobes
- c. Scalp
- d. Neck

2-48. What is the common cause of infection in the area described in item 2-47?
- a. Beauty marks (moles)
- b. Boils and carbuncles
- c. Shaving cuts
- d. Neck bruises

PART II

MATCHING ITEMS

ITEMS 2-49 through 2-51. The following are definitions of various kinds of materials used for administering first aid for a variety of wounds. Column A lists the technical definition of the material. Column B lists the term used to express the definition. Match the appropriate term in Column B with its definition in Column A.

COLUMN A	COLUMN B
2-49. A general term used to describe everything used to cover a wound.	a. Compress b. Dressing
2-50. A sterile pad placed directly over a wound.	c. Bandage d. Support
2-51. That which is used to hold packs, sponges, plasters, etc., in place.	

ITEMS 2-52 through 2-55. The following are definitions of various kinds of bandages used for dressings in first aid situations. Column A lists the technical definition of the material. Column B lists the term used to express the definition. Match the appropriate term in Column B with its definition in Column A.

COLUMN A	COLUMN B
2-52. A longitudinal bandage that passes around the chest, splinting an injured arm to to the chest or limiting the movement of fractured ribs.	a. Triangular b. Cravat c. Tailed d. Swathe
2-53. A longitudinal bandage, both ends of which have tails that can be used to secure a dressing on protruding body parts.	
2-54. A three-cornered muslin bandage most commonly used as a sling.	
2-55. A basic three-cornered bandage folded so that it is particularly useful as a pressure dressing for the head.	

PART III

MULTIPLE-CHOICE ITEMS

LEARNING OBJECTIVE for items 2-56 through 2-58. Identify the general purpose and principles of first aid splinting.

2-56. The main reason for immobilizing a fracture is to
- a. prevent further injury.
- b. eliminate pain and swelling.
- c. decrease blood circulation.
- d. increase blood circulation.

2-57. To fit well and provide adequate immobilization to an injured part, a splint must be
- a. strong, rigid, and applied tightly.
- b. extend 3 inches above and below a fracture.
- c. twice the width of the limb.
- d. well padded at body contact areas.

2-58. What should you do if the victim's fingers become blue or cold following the splinting of an arm injury?
   a. Vigorously massage the hand.
   b. Loosen the fastenings on the splint.
   c. Elevate the affected arm.
   d. Warm the hand with a hot water bottle.

LEARNING OBJECTIVE for items 2-59 and 2-60: Identify the major types of fractures.

2-59. Which of the following describes an open fracture?
   a. The skin is not broken.
   b. The bone is splintered.
   c. There is an open wound.
   d. The bone is broken in several places.

2-60. Which of the following fractures are most likely to become infected?
   a. Multiple
   b. Simple
   c. Closed
   d. Open

LEARNING OBJECTIVE for items 2-61 through 2-73: Identify the characteristics, management, and secondary complications of fractures at various sites.

2-61. The primary goal in the first aid treatment of fractures is to
   a. immobilize the area.
   b. splint the extremity.
   c. set the fracture.
   d. straighten the deformity.

2-62. What is a characteristic sign of upper arm and forearm fractures?
   a. A noticeable deformity
   b. Wobbly motion at the site of the fracture
   c. A snapping or grating sound
   d. Pain radiating to the neck

2-63. Pressure in the armpit from a splint or pad may cause
   a. severe swelling.
   b. paralysis of the neck muscles.
   c. compression of blood vessels and nerves.
   d. abscesses and infections.

2-64. Severe muscle spasms cause excruciating pain in fractures of the
   a. forearm.
   b. upper arm.
   c. lower leg.
   d. thigh.

2-65. What is the correct way to splint a fractured thigh bone?
   a. After straightening the leg, apply one splint from armpit to foot, and another from crotch to foot.
   b. After straightening the leg, apply two splints of equal length, extending from hip to ankle.
   c. After straightening the leg, apply two to four splints, depending on the location of the fracture.
   d. Using two supports, splint the leg in the position in which you find it.

2-66. The use of three splints is recommended for fractures of the
   a. forearm.
   b. upper arm.
   c. thigh.
   d. lower leg.

2-67. What is the characteristic position assumed by a person with a fractured right collarbone?
   a. Right hand behind the head
   b. Right elbow supported with left hand
   c. Left shoulder lower than the right when standing
   d. Right arm drawn away from its normal position

2-68. Which of the following minimize the danger to the lungs and heart in victims with fractured ribs?
   a. Strapping the ribs with adhesive tape
   b. Keeping the victim comfortable and quiet
   c. Having the victim avoid deep breathing
   d. Giving the victim oxygen as soon as possible

2-69. Which bandage is recommended for immobilizing fractured ribs?
   a. Velpeau
   b. Barton
   c. Swathe
   d. Cravat

2-70. What is the most important consideration in caring for a victim with a fractured jaw?
   a. Applying an immobilization bandage immediately
   b. Resetting the jaw as soon as possible
   c. Salvaging as many teeth as possible
   d. Ensuring an open airway and adequate breathing

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2-71. Both open and closed skull fractures are serious because
- a. of their tendency to bleed profusely.
- b. they become infected easily.
- c. of the possibility of brain damage.
- d. they are very slow to heal.

2-72. The most serious potential problem of a spinal fracture is
- a. permanent damage to the spinal cord.
- b. acute pain at the point of fracture.
- c. interference with movement and feeling.
- d. alterations in body temperature mechanisms.

2-73. A victim suspected of having a spine fracture should be treated as if he had
- a. advanced shock.
- b. a broken neck.
- c. a broken pelvis.
- d. a ruptured bladder.

LEARNING OBJECTIVE for items 2-74 and 2-75: Identify the characteristics of dislocations, sprains, strains, and contusions.

2-74. Dislocations, sprains, strains, and contusions are injuries of the
- a. blood vessels and ligaments.
- b. joints and nerves.
- c. nerves and blood vessels.
- d. joints and muscles.

2-75. Accidental injuries to the jaw, shoulder, finger, and hip are usually
- a. contusions.
- b. dislocations.
- c. sprains.
- d. strains.

Assignment 3

Injuries From Heat and Cold; Drug Abuse and Poisoning; Common Medical Emergencies

Textbook, NAVEDTRA 10081-C: Chapters 7 through 9

PART I

MULTIPLE-CHOICE ITEMS

LEARNING OBJECTIVE for items 3-1 through 3-4: Identify factors used to determine the state of burn injuries.

3-1. What is the most important factor in determining the seriousness of a burn and estimating the victim's chance of recovery?
a. The depth of the burn
b. The cause of the burn
c. The extent of the burn
d. The age of the victim

3-2. According to the "rule of nines," which of the following areas are estimated to comprise 9% of the body surface?
a. Each leg
b. Each arm
c. Front of the trunk
d. Back of the trunk

3-3. In an adult, burns involving what percentage of the body area are considered fatal?
a. 9%
b. 18%
c. 20%
d. 30%

3-4. A burn in which the skin is reddened but not blistered is a ________ degree burn.
a. first
b. second
c. third
d. fourth

LEARNING OBJECTIVE for items 3-5 and 3-6: Identify the body's physiological response to burns and burn care.

3-5. What medical emergency always accompanies or follows extensive burns?
a. Airway problems
b. Respiratory difficulties
c. Shock
d. Infection

3-6. What effect does cold water or cold packs have on burns?
a. Speeds up blister formation
b. Reduces tissue destruction
c. Increases tissue swelling
d. Relaxes the victim

LEARNING OBJECTIVE for items 3-7 through 3-11: Identify some key factors in administering first aid to victims of various types of burns.

3-7. How should you treat foreign material adhering to a severely burned area?
a. Remove it carefully.
b. Soak the involved area in warm salt water.
c. Scrub the involved area with soap and water.
d. Leave it alone.

3-8. Which two types of chemical burns are not flushed with water?
a. Dry lime and phenol
b. White phosphorus and lye
c. Phenol and acids
d. Lye and alkalies

3-9. What is the immediate first aid for chemical burns of the eye?
a. Bathe with warm salt water.
b. Neutralize with alcohol drops.
c. Flush with baking soda solution.
d. Flush with large amounts of water.

3-10. What serious condition frequently accompanies or follows electrical burns?
a. Cardiac arrest
b. Chronic infection
c. Permanent scarring
d. Kidney failure

3-11. What should be used to cover an electrical burn injury before transporting the victim?
a. Mineral oil
b. Ice packs
c. Dry, sterile dressing
d. Vaseline gauze dressing

LEARNING OBJECTIVE for items 3-12 through 3-16: Identify the cause and treatment of heat exposure injuries.

3-12. What heat exposure injury results from loss of excessive amounts of salt and water?
a. Heat exhaustion
b. Heatstroke
c. Sunstroke
d. Sun poisoning

3-13. What heat exposure problem often occurs after excessive sweating and gulping down large quantities of cold drinks?
a. Heat prostration
b. Heat collapse
c. Heatstroke
d. Heat cramps

3-14. What heat exposure injury results from a breakdown of the body's ability to sweat?
a. Heat exhaustion
b. Heatstroke
c. Sunstroke
d. Sun poisoning

3-15. The purpose of all first aid measures for heatstroke is to
a. restore salt and water loss.
b. relieve shock.
c. prevent convulsions.
d. lower the body temperature.

3-16. Which of the following treatments is recommended for a heatstroke casualty?
a. Place him in the shock position.
b. Give him iced tea if he is conscious.
c. Spray cold water over his body.
d. Give him hot coffee if he is conscious.

LEARNING OBJECTIVE for items 3-17 through 3-24: Identify the cause, development, and treatment of cold exposure injuries.

3-17. What type of weather causes the most severe cold injuries?
a. Cold, wet, and windy
b. Cold, dry, and windy
c. Cold, wet, and calm
d. Cold, dry, and calm

3-18. First aid for a conscious victim suffering from general cooling consists of providing
a. monitored rewarming.
b. vigorous massage.
c. oral stimulants.
d. alcoholic drinks.

3-19. During field operations, which of the following is the most readily available first aid method for treating a victim of hypothermia?
a. Engine exhausts
b. Rewarming tubs
c. "Buddy warming"
d. Artificial heat

3-20. Unrecognized or untreated cases of immersion foot are serious because they
a. have a high mortality rate.
b. often develop into gangrene.
c. are highly communicable.
d. are early symptoms of hypothermia.

3-21. What is the name of the freezing injury that occurs so progressively that the victim often is not aware of it?
a. Chilblain
b. Immersion foot
c. Frostbite
d. Immersion hypothermia

3-22. For which of the following reasons should a frostbitten area be allowed to stay frozen?
a. Until diagnosis is confirmed
b. If there is any possibility of refreezing
c. To minimize the severity of pain
d. To increase the acclimatization process

3-23. What should victims of frostbitten feet do until they are treated by medical personnel?
a. Vigorously massage the feet.
b. Warm the feet by an open fire.
c. Rub snow on the feet.
c. Keep walking on them.

3-24. In which of the following freezing injuries is rapid rewarming the best treatment?
a. Immersion foot
b. Frost nip
c. Chilblain
d. Frostbite

PART II

MATCHING ITEMS

Most drugs knowingly misused are taken for their "reality" altering affect. Certain physical effects are characteristic of specific types of drugs. Column A lists some common terms for drug types. Column B lists some characteristic effects of drug types. Match the effects in Column B with the appropriate drug type in Column A.

Column A

3-25. Hallucinogens

3-26. Alcohol

3-27. Downers

3-28. Uppers

Column B

a. Talkativeness
b. Flashbacks
c. DT's
d. "Driftiness"

PART III

MULTIPLE-CHOICE ITEMS

LEARNING OBJECTIVE for items 3-29 through 3-32: Identify the treatment and problems associated with drug abuse injuries.

3-29. Which of the following is a common result of sniffing glue?
a. Bad trip
b. Flashback
c. Irritability
d. Death

3-30. How can you best assist medical personnel when you bring in an overdose, drug abuse, or poisoning victim?
a. Standby to initiate cardiopulmonary resuscitation.
b. Bring with the victim all materials and information relating to the incident.
c. Inform the victim's command and next of kin of the incident.
d. Do not talk to anyone about the incident until it is cleared by investigating authorities.

3-31. If all of the following were available by phone, which would you contact first for information regarding a suspected case of poisoning?
a. Emergency room of the nearest military facility
b. Public Health Service
c. Local Poison Control Center
d. Nearest private physician

3-32. After you have received the necessary information from the above source (ques. 3-31) to administer first aid, what should you do immediately?
a. Get the victim to medical help quickly.
b. Observe the victim closely for at least 2 hours.
c. Inform the victim's duty station of the incident.
d. Give the victim the universal antidote.

LEARNING OBJECTIVE for items 3-33 through 3-36: Identify the symptoms and treatment of poisoning by ingestion.

3-33. If you do not know what caused the poisoning,
a. do absolutely nothing without medical help.
b. dilute the poison and make the victim vomit.
c. neutralize the poison and do not let the victim vomit.
d. keep the airway open and administer CPR as needed.

3-34. For which classification of poisoning would you administer milk or water?
a. Corrosives
b. Noncorrosives
c. Petroleum products
d. Fish or shellfish

3-35. Water and vinegar are used to neutralize which kind of ingested poisons?
a. Petroleum products
b. All corrosives
c. Acids
d. Alkalies

3-36. What would you give a victim who swallowed gasoline while siphoning it from a buddy's gas tank?
a. Black eye
b. Burned toast
c. Mineral oil
d. Beer

LEARNING OBJECTIVE for items 3-37 and 3-38: Identify a symptom and treatment of inhalation poisoning.

3-37. What is the characteristic symptom of carbon monoxide poisoning?
a. Cherry red lips
b. Bluish-colored skin
c. Complaints of a strange taste
d. Stains around the mouth

3-38. What should you do after rescuing and resuscitating a victim of inhalation poisoning?
a. Administer warm, stimulating drinks.
b. Offer a cigarette to relax him.
c. Keep him quiet and treat for shock.
d. Administer carbon dioxide to stimulate deep breathing.

LEARNING OBJECTIVE for items 3-39 through 3-50: Identify the incidence, symptoms, and treatment of poisonous bites and stings.

3-39. What general statement can be made about black widow and brown recluse spiders?
a. They are generally harmless.
b. Their bites are serious but rarely fatal.
c. Their bites are always fatal.
d. Most victims experience severe allergic reactions.

3-40. Which of the following is included in the treatment of victims experiencing a major reaction to a bite or sting on the extremity?
a. Apply warm compresses to increase circulation.
b. Elevate the extremity to reduce swelling.
c. Apply a tourniquet above the bite.
d. Apply a constricting band above the bite.

3-41. Which of the following common poisonous snakes found in the United States are NOT classified as a pit viper?
a. Rattlers
b. Moccasins
c. Copperheads
d. Corals

3-42. Why is it imperative for medical personnel who treat snakebite victims to know what type of snake was involved?
a. To anticipate and treat hemotoxic
b. To anticipate and treat neurotoxic reactions
c. To obtain and administer the proper antivenom
d. To complete the Department of Health reporting form

3-43. Which of the following is the best way to determine the seriousness of a snakebite?
a. Assessing the victim's condition
b. Verbal report by the victim
c. Location of the bite
d. Bite pattern of the wound

3-44. In treating snakebite victims, first aid is directed toward administering which type of care?
a. Definitive
b. Supportive
c. Restorative
d. Rehabilitative

3-45. In which of the following types of bites are ice packs applied only under the direction of a physician?
a. Spider
b. Scorpion
c. Snake
d. Rat

3-46. Incision and suction of the entry site is not recommended for which kind of snakebite?
a. Sea snakes
b. Neurotoxic snakes
c. Hemotoxic snakes
d. Stringrays

3-47. Why is incision and suction NOT recommended for treating all snakebites?
a. It usually causes more harm than good.
b. Most people do not know the correct procedure.
c. It is effective only when the bite causes a local effect.
d. It is illegal for anyone who is not a doctor to make an incision.

3-48. Injuries from moray eels generally consist of
- a. stings.
- b. fractures.
- c. airway obstruction.
- d. bleeding.

3-49. Which of the following statements is NOT correct?
- a. Sea snakes are not very dangerous since their fangs are only one-fourth inch long.
- b. Death is rare among scuba divers who are injured by stingrays.
- c. The tentacles of jellyfish cause severe pain and injury.
- d. The venom of sea snakes is both hemotoxic and neurotoxic.

3-50. If it is necessary to kill a suspected rabid squirrel who has bitten a person, what should you do with the animal's body?
- a. Burn it to prevent further infection.
- b. Bury it to prevent further infection.
- c. Give it to the authorities to check.
- d. Take it to a taxidermist to be stuffed.

LEARNING OBJECTIVE for item 3-51: Identify the function of the medic alert concept.

3-51. A medic alert card might be used to indicate that the bearer has any of the following medical problems EXCEPT
- a. allergies.
- b. asthma.
- c. amnesia.
- d. epilepsy.

LEARNING OBJECTIVE for items 3-52 through 3-75: Identify pertinent general knowledge and first aid management of victims who have common medical problems which result in breathing, heart, and/or nervous system malfunctions.

3-52. After ensuring that an unconscious person is breathing adequately and not hemorrhaging,
- a. attempt to determine the cause of the unconsciousness.
- b. cause the victim to vomit.
- c. immediately place the victim in shock position.
- d. start closed chest massage.

3-53. What position is most helpful to a person who feels faint?
- a. Sitting up in a chair
- b. Flat, with head and shoulders raised
- c. Reverse shock position
- d. Head and shoulders lower than the rest of the body

3-54. Which is the quickest and easiest way to determine if an unconscious person is a diabetic?
- a. Check for a medic alert tag or card.
- b. Look for signs and symptoms of acidosis.
- c. Check the breath for alcohol odor.
- d. Look for a cherry red color of the lips.

3-55. Which symptom is the characteristic clue indicating diabetic coma?
- a. Cherry red lips
- b. Moist, clammy skin
- c. Involuntary muscular twitching
- d. A sickly sweet breath

3-56. What can you do for the unconscious victim of diabetic coma if medical help is going to be delayed?
- a. Place a sugar cube under the tongue.
- b. Treat for shock and give a salt solution enema.
- c. Give the victim a salt solution to drink.
- d. Give cardiopulmonary resuscitation.

3-57. If you come upon an unconscious person who has no characteristic odor of acetone on his breath, you can be certain that
- a. he is in insulin coma.
- b. you will have to look for more signs and symptoms.
- c. he has overdosed on drugs.
- d. he has hyperventilated in trying to cope with a stressful situation.

3-58. A diabetic going into insulin coma may ask for
- a. a sweet drink or sugar.
- b. a cold, wet cloth.
- c. strong black coffee.
- d. several warm blankets.

3-59. A person with a history of high blood pressure whose face suddenly looks red and congested and whose neck veins are swollen probably is having
- a. a gall bladder attack.
- b. an asthmatic attack.
- c. a seizure.
- d. a stroke.

3-60. To protect the stroke victim from further injury, do all of the following EXCEPT
- a. placing him in a semisitting position.
- b. keeping his head and shoulders lowered.
- c. be prepared for vomiting.
- d. watching him.

3-61. In what position should you place a heart attack victim who has a pulse and is still breathing?
a. Shock
b. Flat on his back
c. On his right side
d. Half-sitting

3-62. Which sign indicates that a heart attack victim's heart is no longer beating?
a. Ashen-colored face
b. Projectile vomiting
c. Lack of pulse
d. Lack of breathing

3-63. The majority of heart attack victims
a. die instantly.
b. require CPR.
c. rarely have repeated attacks.
d. become chronic invalids.

3-64. If a person who is allergic to bee stings goes into anaphylactic shock, what life-threatening conditions might develop?
a. Respiratory obstruction, hives, mottled skin
b. Inability to talk, severe headache, hives
c. Giant hives, severe coughing, shock
d. Swollen throat, respiratory failure, cardiac arrest

3-65. When giving first aid to a victim of anaphylaxis, you must be prepared to
a. start CPR.
b. begin warm water immersion.
c. begin cold water immersion.
d. inject an antihistamine.

3-66. An asthmatic attack might be triggered by any of the following EXCEPT
a. beeswax.
b. smoke.
c. pollen.
d. dust.

3-67. Which of the following constitutes a principal danger to a convulsing victim? He may
a. injure others.
b. injure himself.
c. lose his job.
d. develop a mental problem.

3-68. A suitable material to protect a convulsing person from biting his tongue is a
a. plastic utensil.
b. folded handkerchiefs.
c. long screwdriver.
d. popsicle stick.

3-69. Which of the following statements is true?
a. People who have developed a tolerance for alcohol can drink more than the average person without harmful effects.
b. Occasional excessive use of alcohol has no dangers and may even be beneficial.
c. Heavy drinking does not pose any real problems unless it interferes with work.
d. A person suffering from alcohol intoxication may be dangerous to himself and others.

3-70. All of the following will help an intoxicated person EXCEPT
a. giving a salt laxative.
b. drinking a Bloody Mary.
c. inducing vomiting.
d. not believing him when he says he is all right.

3-71. From a first aid perspective, one of the *best* ways to handle a delirious person is to
a. protect him from harm by using physical restraints.
b. talk calmly to him, emphasizing reality.
c. bring him back to reality with a hard slap.
d. immerse him in a tub of cold water.

3-72. What is the best first aid you can provide a nonbreathing drowning victim while he is still being pulled ashore?
a. Keep his head above water.
b. Start artificial ventilation.
c. Periodically slap him on the back.
d. Get him out of the water fast.

3-73. A casualty is pinned beneath a machine and subjected to high voltage. While another rescuer attempts to kill the electricity, you should
a. begin cardiopulmonary resuscitation.
b. grab the victim and pull him free immediately.
c. stand clear until the current is turned off.
d. douse the victim with cold water to prevent further burns.

Assignment 4

NBC Agent Casualties; Rescue and Transportation

Textbook, NAVEDTRA 10081-C: Chapter 10 and 11

PART I

MULTIPLE-CHOICE ITEMS

LEARNING OBJECTIVE for item 4-1:
Identify the major goal of NBC warfare.

4-1. What is the general purpose of nuclear, biological, and chemical warfare?
- a. To produce casualties
- b. To kill the enemy
- c. To poison food sources
- d. To destroy equipment

LEARNING OBJECTIVE for items 4-2 through 4-26:
Identify the effects of CW agents and the recommended protective and treatment measures.

4-2. Which of the following chemical agents are considered quick killers?
- a. Blister agents
- b. Choking agents
- c. Nerve agents
- d. Vomiting agents

4-3. Protection of personnel against the "G-agents" depends chiefly on
- a. the availability of detection equipment.
- b. individual physical conditioning.
- c. adequate alert systems.
- d. the speed in taking protective measures.

4-4. Which part of the body do blister agents affect first?
- a. Moist areas
- b. Hairy areas
- c. The mucous membranes
- d. Light pigmented areas

4-5. Victims with symptoms similar to those of drug or alcohol abuse may have been exposed to
- a. blister agents.
- b. psycho agents.
- c. tear agents.
- d. nerve agents.

4-6. Blood agents usually gain entry into the body by
- a. absorption.
- b. inhalation.
- c. ingestion.
- d. injection.

4-7. What characteristic symptoms occur within a few seconds after exposure to low concentrations of blood agents?
- a. Deep breathing and convulsions
- b. Rapid breathing and convulsions
- c. Nausea, dizziness, and headache
- d. Nausea, vomiting, and shivering

4-8. What is the first thing you should do if you detect the presence of a choking agent?
- a. Give the alarm.
- b. Stop breathing.
- c. Clear your mask.
- d. Put on your mask.

4-9. When does vomiting begin after the victim's exposure to a vomiting agent?
- a. Immediately
- b. After severe muscle cramps
- c. After violent convulsions
- d. After violent sneezing

4-10. Following exposure to a vomiting agent, what would you do if you started vomiting after pulling on your protective mask?
- a. Remove the mask immediately to avoid breathing in the vomitus.
- b. Clean the mask out, then put it on again.
- c. Take the mask off to vomit, but do not breathe.
- d. Pull the mask away from the chin, but do not take it off.

4-11. Which of the following chemical agents are the least toxic?
- a. Psycho agents
- b. Choking agents
- c. Vomiting agents
- d. Tear agents

4-12. Under battle conditions, who is responsible for personal decontamination?
- a. Damage control personnel
- b. Medical department personnel
- c. First aid personnel
- d. The affected individuals

4-13. The M258 decontamination kit is used for
- a. total personal decontamination.
- b. clothing decontamination only.
- c. skin decontamination only.
- d. skin and clothing decontamination only.

4-14. The Combo-Pen injector is used to neutralize the effects of
- a. nerve agents.
- b. blood agents.
- c. psycho agents.
- d. vomiting agents.

4-15. Which of the following drugs are used to neutralize the effects of nerve agent exposure?
- a. Morphine
- b. Atropine
- c. Valium
- d. Amyl nitrate

4-16. What is the first thing you should do if liquid nerve agents get into your eye?
- a. Put on your mask immediately.
- b. Flush out the eye with water.
- c. Irrigate the eye with mineral oil.
- d. Apply protective ointment to the eye.

4-17. What should you do immediately if your skin is contaminated by a liquid nerve agent?
- a. Inject atropine.
- b. Remove the liquid.
- c. Apply protective ointment.
- d. Use the Combo-Pen.

4-18. What is the first step in removing a liquid blister agent from the skin?
- a. Applying protective ointment
- b. Scrubbing with soap and water
- c. Flushing with water
- d. Pinch-blotting the liquid

4-19. What is the first step in removing or neutralizing blister agents from the eyes?
- a. Flush the eyes with water.
- b. Blot the liquid with an absorbent cloth.
- c. Instill olive oil into the eyes.
- d. Apply protective ointment to the eyes.

4-20. What is the recommended procedure for skin decontamination when blister agent exposure is discovered late?
- a. Wash the blistered area with soap and water.
- b. Wash the reddened area with soap and water.
- c. Shave off all contaminated hair.
- d. Apply a soothing ointment to the area.

4-21. Toxic exposure to incapacitating agents on very hot days can lead to
- a. fainting.
- b. sunburn.
- c. heat exhaustion.
- d. heatstroke.

4-22. After masking, what self-aid treatment is recommended for blood agent inhalation?
- a. An atropine injection
- b. Inhalation of pure oxygen
- c. Amyl nitrite inhalation
- d. A Combo-Pen injection

4-23. What activities should a victim of blood agent exposure engage in?
- a. Only necessary movements
- b. All field activities
- c. Normal activities
- d. Any activities assigned

4-24. What does phosgene smell like?
- a. Bitter almonds
- b. Citrus fruit
- c. Newly mowed hay
- d. Ammonia cleaner

4-25. What activities should a victim of vomiting agent exposure engage in?
- a. Only necessary activities
- b. Only necessary movements
- c. Normal activities
- d. Vigorous activities

4-26. How many ampules of amyl nitrite are administered in one dose for relief of blood gas poisoning?
- a. Two
- b. Three
- c. Four
- d. Five

LEARNING OBJECTIVE for item 4-27: Identify a necessary commodity for the successful decontamination of any warfare agent.

4-27. What is the most important commodity that should be used in approaching the problem of decontamination?
- a. Competent medical personnel
- b. Trained damage control personnel
- c. Common sense
- d. Appropriate neutralizing agents

LEARNING OBJECTIVE for items 4-28 through 4-32: Identify the effects of BW agents and the recommended protective and treatment measures.

4-28. The deliberate use of disease-producing agents in a nonmedical situation is referred to as
- a. chemical warfare.
- b. biological warfare.
- c. disease warfare.
- d. radiological warfare.

4-29. In a warfare situation, disease germs can be very effectively transmitted by
- a. aerosols.
- b. injection.
- c. insect vectors.
- d. animal vectors.

4-30. What is your first line of defense against BW attacks?
- a. Natural resistance
- b. Immunizing shots
- c. Protective clothing
- d. Antibiotic drugs

4-31. As precautions against contamination after a BW attack, avoid all of the following practices except
- a. bathing in running water.
- b. taking souvenirs.
- c. chewing grass.
- d. drinking native water.

4-32. The best treatment for biological warfare casualties is
- a. immediate first aid.
- b. advanced first aid.
- c. intense medical care.
- d. rehabilitation care.

LEARNING OBJECTIVE for items 4-33 through 4-44: Identify the effects of NW agents and the recommended protective and treatment measures.

4-33. Most of the casualties of a nuclear explosion are due to
- a. heat and blast.
- b. heat and radiation.
- c. blast and radiation.
- d. blast and chemical poisoning.

4-34. What NBC agent resembles X-rays in its ability to destroy blood-forming cells?
- a. Nuclear particles
- b. Typhoid organisms
- c. Carbon monoxide
- d. Infrared rays

4-35. What is usually the first sign of radiation overexposure?
- a. Convulsions and fever
- b. Nausea and vomiting
- c. Skin rashes and loss of hair
- d. Sore mouth and throat

4-36. What type of nuclear explosion produces the greatest damage from blast and heat?
- a. Air burst
- b. Ground burst
- c. Water burst
- d. Underground burst

4-37. What types of nuclear explosions produce the most persistent radiation hazards?
- a. Air and water bursts
- b. Water and ground bursts
- c. Ground and air bursts
- d. Air and underground bursts

4-38. What type of nuclear explosion does not create radioactive areas on the ground?
- a. Air burst
- b. Ground burst
- c. Underground burst
- d. Water burst

4-39. What body position provides the most protection from a nuclear air burst?
- a. Standing, with the head covered
- b. Sitting, with the knees drawn up
- c. Sitting, with the head covered
- d. Lying flat, with the face covered

4-40. Which of the following articles provides the best protector against radioactive materials?
- a. A newspaper
- b. A raincoat
- c. An umbrella
- d. A board

4-41. **After NW agent exposure, which of the following would be the most effective action?**
- a. Remove clothing and footwear
- b. Report to the medical aid station
- c. Report to the decontamination station
- d. Report to your commanding officer

4-42. If the correct answer to question 4-41 is not possible, what alternate action should you take in the same situation?
- a. Shake, brush, or scrape material from clothing
- b. Report to the nearest hospital
- c. Move to an open windy area
- d. Remain at your duty or battle station until help arrives

4-43. When taking a decontamination shower, what areas should be scrubbed extra well?
- a. Areas where the skin was exposed
- b. Body creases and hairy parts
- c. Areas around all body orifices
- d. Head, hands, and feet

4-44. The most effective way to decontaminate yourself after skin contact with radioactive material is to
- a. scrub your whole body with soap and warm water.
- b. brush your outer clothing thoroughly.
- c. immediately apply protective ointment to exposed skin areas.
- d. remove and shake your outer garments.

LEARNING OBJECTIVE for items 4-45 through 4-53: Identify various types of protective equipment and their use in rescue situations.

4-45. What is the value of an oxygen breathing apparatus in rescue operations?
- a. To filter dust, mist, and vapors from the atmosphere
- b. To provide positive pressure ventilation for the rescuer
- c. To provide negative pressure ventilation for the rescuer
- d. To provide independence from the outside atmosphere

4-46. Never allow any part of an oxygen breathing apparatus to come in contact with grease or oil, because the oxygen
- a. will deteriorate and become useless.
- b. may combine with the hydrogen in the grease or oil and become too highly concentrated.
- c. will be rendered incapable of combining with the air from the canister.
- d. is highly explosive in the presence of grease and oil.

4-47. Connecting an airline mask to an oxygen source could result in
- a. carbon monoxide poisoning.
- b. carbon dioxide poisoning.
- c. an oil contact explosion.
- d. a friction contact explosion.

4-48. The airline mask is superior to the oxygen breathing apparatus for use in spaces that contain
- a. undetectable carbon monoxide gas.
- b. high concentrations of gasoline vapors.
- c. high concentrations of ammonia fumes.
- d. heavy concentrations of smoke.

4-49. The wearer of an airline mask and a line tender can communicate during a rescue operation by using
- a. standard sign language for the deaf.
- b. body and hand language.
- c. short-range walkie-talkies.
- d. standard divers' signals.

4-50. Against which of the following vapors do gas masks offer the most effective protection?
- a. Chemical agents
- b. Carbon monoxide
- c. Gasoline vapors
- d. Petroleum smoke

4-51. The asbestos suit protects the wearer during a
- a. brief exposure to flames.
- b. prolonged exposure to steam.
- c. brief exposure to toxic gases.
- d. prolonged exposure to extreme heat.

4-52. Where should you attach a lifeline to an unconscious person to haul him up from a burning compartment?
- a. Around his chest under the arms
- b. Around his hips or below the groin
- c. Around his waist and to the belt
- d. Around his wrists or ankles

4-53. Which of the following devices is used to detect oxygen deficiency in closed spaces?
- a. Combustible-gas indicator
- b. Flame safety lamp
- c. Carbon monoxide indicator
- d. A live canary

LEARNING OBJECTIVE for items 4-54 thru 4-60: Identify the rescue procedures recommended for use in steam-filled spaces and in fire, water, and electrical accidents.

4-54. How should you extinguish fire in a person's clothing if nothing is available to smother the flame?
- a. Lie on the victim and cover him with your body.
- b. Loosen the victim's clothing and roll him over rapidly.
- c. Remove the victim's clothing and throw dirt on him.
- d. Roll the victim over slowly and beat out the flames with your hands.

4-55. Why is it unsafe to allow a person whose clothing is on fire to remain in a standing position?
- a. He may die from inhaling flames.
- b. His clothing will burn more rapidly.
- c. The fire may spread to his hair.
- d. The fire will be more difficult to extinguish.

4-56. What should you do to save yourself if you are caught in the upper story of a burning building?
- a. Jump to the ground.
- b. Improvise a lifeline and lower yourself to the ground.
- c. Lie on the floor until you are rescued.
- d. Open the windows to let in fresh air.

4-57. In a burning compartment, wear a wet cloth over the nose and mouth to protect you from
- a. hot air inhalation burns.
- b. carbon monoxide poisoning.
- c. carbon dioxide poisoning.
- d. dry air inhalation irritation.

4-58. What immediate action should you take to protect a victim in a steam-filled compartment if the only exit is blocked by escaping steam?
- a. Move the victim to the lowest level in the compartment.
- b. Move the victim to the highest point in the compartment.
- c. Cover the victim's mouth and nose with a wet cloth.
- d. Clothe the victim in an asbestos suit.

4-59. What is the first thing you should do in rescuing a victim from electrical contact?
- a. Cut the contact with a wooden-handled ax.
- b. Look for the switch that turns off the current.
- c. Separate the victim from the contact by pulling on his clothing.
- d. Remove the wire from the victim's body with a nonconducting object.

4-60. Which of the following methods should you use to rescue a drowning person, if you have had no special training in lifesaving techniques?
- a. Swim out to help him to safety.
- b. Extend a line or pole and pull him to safety.
- c. Shout encouragement to him.
- d. Phone, signal, or call for help.

LEARNING OBJECTIVE for items 4-61 through 4-71: Identify recommended principles for moving and transporting victims in first aid situations.

4-61. An injured person may be moved by a first-aider only if his position
- a. puts him in danger of shock.
- b. endangers his life.
- c. is inconvenient for giving first aid.
- d. prevents his receiving first aid.

4-62. What is the initial position of the victim in the fireman's carry?
- a. Face down, head toward the rescuer
- b. Face up, head toward the rescuer
- c. Face down, head away from the rescuer
- d. Face up, head away from the rescuer

4-63. The tied-hands crawl is used to transport an unconscious person who
- a. is seriously injured.
- b. is too heavy to be lifted.
- c. must be dragged for a long distance.
- d. must be dragged under a low structure.

4-64. Which of the following emergency **transport methods may be used for moving seriously injured personnel?**
- a. Blanket drag
- b. Pack-strap carry
- c. One-man arm carry
- d. Two-man arm carry

4-65. If you are using a blanket drag to transport an injured man, move the casualty by pulling him on his
- a. back, feet first.
- b. back, head first.
- c. stomach, feet first.
- d. stomach, head first.

4-66. What is the advantage of the chair carry?
- a. Ease of transportation over stairs
- b. Ease of transportation of heavy persons
- c. Safety of transportation for persons with pelvic injuries
- d. Safety of transportation for persons with neck injuries

4-67. What precaution should you take when transporting an injured person by stretcher?
- a. Raise his head and shoulders.
- b. Tie his hands together.
- c. Lay him on his back.
- d. Strap him to the stretcher.

4-68. The Stokes stretcher can be used for all of the following purposes except
- a. removing victims from compartments with small access hatches.
- b. transferring injured persons from ship to ship.
- c. transferring injured persons from ship to shore.
- d. rescuing injured survivors from the water.

4-69. When padding the Stokes stretcher, under what parts of the injured person's body should you place blankets?
- a. Each leg
- b. The back and the head
- c. Each leg, the head, and the shoulders
- d. The body and the legs

4-70. When you transport an injured person on a Stokes stretcher, what part of his body should you fasten to the end of the stretcher?
- a. Head
- b. Arms
- c. Shoulders
- d. Feet

4-71. How are the straps fastened to the injured person in the Stokes stretcher?
- a. Under the blanket, across the chest and knees
- b. Under the blanket, across the chest, hips, and knees
- c. Over the blanket, across the shoulders, knees, and feet
- d. Over the blanket, across the chest, hips, and knees

PART II

MATCHING ITEMS

ITEMS 4-72 through 4-75. In disasters involving multiple casualties, rescue activities should be conducted according to priorities. Column A describes the disaster casualty situation. Column B lists the priority for the disaster casualty situation. Match the priority listed in Column B with the appropriate situation.

Column A

4-72. The extrication of dead bodies.

4-73. The removal of lightly pinned casualties.

4-74. Situation requiring much time and special equipment.

4-75. Removal of casualties possible within a reasonable time and with available equipment.

Column B

- a. First
- b. Second
- c. Third
- d. Fourth

Assignment 5

Review/Overview

Textbook, NAVEDTRA 10081-C: Chapters 1 through 11 and Glossary

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Assignment V is a review of the entire course. Part 1 is composed of standard multiple-choice questions that reemphasize key principles throughout the manual. Part 2 uses brief situational problems to check material comprehension. Part 3 is composed of true-false questions. Part 4 contains terms and definitions that describe common medical signs, symptoms, and findings.

Refer to the entire manual when working on this assignment. The learning objectives are designed to guide you in checking your response to each question.

PART I

MULTIPLE-CHOICE ITEMS

LEARNING OBJECTIVE for item 5-1: Identify the life-threatening condition that stops the pumping function of the heart.

5-1. A person whose heart has stopped beating is said to be suffering from
   a. respiratory failure.
   b. cardiac arrest.
   c. airway blockage.
   d. cardiopulmonary failure.

LEARNING OBJECTIVE for item 5-2: Identify the appropriate first aid position for a common medical emergency.

5-2. If you find an unconscious person whose face is red, you should
   a. raise his hips and legs.
   b. raise his head and shoulders.
   c. place him on his abdomen.
   d. do nothing until the doctor arrives.

LEARNING OBJECTIVE for item 5-3: Identify life-maintaining first aid priorities.

5-3. In the order of priorities, which of the following are the three primary first aid measures?
   a. Maintain breathing, stop bleeding, manage shock
   b. Stop bleeding, maintain breathing, reduce shock
   c. Prevent shock, stop bleeding, maintain breathing
   d. Stop bleeding, prevent shock, avoid infection

LEARNING OBJECTIVE for items 5-4 thru 5-6: Identify nonfracture injuries to the muskuloskeletal system and the appropriate first aid measure recommended.

5-4. When giving first aid for an injured ligament a few hours after the injury, you should apply
   a. cold compresses.
   b. hot compresses.
   c. a cast.
   d. liniment.

5-5. To give first aid for an injured ligament 24 hours after the accident, you should apply
   a. cold compresses.
   b. hot compresses.
   c. a cast.
   d. liniment.

5-6. Another name for a bruise is
   a. strain.
   b. sprain.
   c. concussion.
   d. contusion.

LEARNING OBJECTIVE for item 5-7: Identify the situation in which an unskilled person might attempt to correct a dislocated joint.

5-7. As a general rule, reduction of a dislocated joint is the standard first aid procedure
   a. in all cases except spinal cord injuries.
   b. whenever there is severe pain in the affected area.
   c. in all cases except spinal cord injuries.
   d. when medical help will not be available for at least 3 days.

LEARNING OBJECTIVE for item 5-8: Identify a potential problem in victims who have experienced neck pain following a serious accident.

5-8. What other problem would you look for in a patient who has a neck wound?
a. A should dislocation
b. A fractured neck
c. A broken nose
d. A suicide attempt

LEARNING OBJECTIVE for item 5-9: Identify the position recommended for a victim with a fractured pelvis.

5-9. Which of the following positions are recommended for a victim who has a fractured pelvis?
a. On his back with legs straight
b. On his back with legs drawn up
c. On his side with legs drawn up
d. One in which he is most comfortable

LEARNING OBJECTIVE for item 5-10: Identify a condition in which the standard shock position would not be used.

5-10. The lower extremities of a victim in shock should be elevated except when he also has
a. tingling sensations in his feet.
b. unsplinted leg fractures.
c. third-degree burns.
d. an open wound on the lower leg.

LEARNING OBJECTIVE for item 5-11: Identify the primary goal of first aid in treating head injuries.

5-11. What is the primary goal in treating a head injury victim suspected of having brain damage?
a. To keep the victim as active as possible
b. To prevent nausea and vomiting
c. To relieve restlessness and pain
c. To prevent further brain damage

LEARNING OBJECTIVE for item 5-12: Identify the cause of collapse resulting from exposure to a major fire.

5-12. An emergency firefighter collapses. He has a rapid, weak pulse; pale, cool skin; headache and dizziness; and dilated pupils. He should be treated for
a. carbon monoxide poisoning.
b. cardiac arrest.
c. heat exhaustion.
d. heatstroke.

LEARNING OBJECTIVE for items 5-13 and 5-14: Identify the treatment recommended for cold injuries of the extremities.

5-13. Which of the following is recommended first aid for immersion foot blisters?
a. Rupture and drain all blisters as they develop.
b. Cover the blisters with heavy layers of oil-based ointments.
c. Apply a dry pressure dressing to compress the blisters.
d. Protect the blisters from rupture or further damage.

5-14. Which of the following is recommended for thawing deep frozen extremities?
a. Rapid rewarming by warm water immersion
b. Rapid rewarming using a dry heat source
c. Slow rewarming at room temperature
d. Slow rewarming by gentle massage

LEARNING OBJECTIVE for item 5-15: Identify an irreversible effect of mishandling a victim of spinal injuries.

5-15. Why should all unconscious accident victims be treated as if they had spinal injuries?
a. Tumors of the spine often develop following trauma accidents.
b. Permanent paralysis can result from damage to the spinal cord.
c. Severe infection will occur rapidly in unnoticed, untreated spinal injuries.
d. The position used for treating spinal injuries is recommended for all injuries.

LEARNING OBJECTIVE for items 5-16 through 5-20: Identify the serious problems associated with drug abuse.

5-16. Which of the following problems is commonly experienced during withdrawal from habitual depressant drug use?
a. Uncontrollable shaking
b. Inappropriate euphoria
c. Constant talking
d. Mental alertness

5-17. What is the immediate major danger associated with an overdose of "downers"?
a. Irreversible shock
b. Respiratory failure
c. Suicidal tendencies
d. Cardiac arrest

5-18. Delirium tremens is a common symptom of withdrawal from chronic use of
a. stimulants.
b. depressants.
c. alcohol.
d. hallucinogens

5-19. An unwanted effect of glue sniffing is
a. hallucination.
b. flashback.
c. respiratory failure.
d. blindness.

5-20. Which of the following is the recommended first aid for a victim who has overdosed on hallucinogens?
a. Protect the victim from inflicting injury to himself and others.
b. Attempt to make the victim vomit and then administer oxygen.
c. Transport him, by force if necessary, to a medical facility.
d. Encourage him to drink plenty of coffee and to walk off the drug effect.

LEARNING OBJECTIVE for items 5-21 and 5-22: Identify the physical characteristics of carbon monoxide and the recommended first aid for victims exposed to this gas.

5-21. Why is carbon monoxide often considered the most dangerous of all toxic gases?
a. It is not detectable by normal methods.
b. It damages the lining of the breathing organs.
c. It is commonly used as fuel in industry processes.
d. It is highly stable in both open and closed spaces.

5-22. What is the best first aid for carbon monoxide poisoning?
a. Vigorous massage
b. Hot drinks
c. Gas mask
d. Fresh air

LEARNING OBJECTIVE for item 5-23: Identify a life-threatening condition that can occur with little or no warning.

5-23. If you find someone with severly swollen face and hands, and obvious breathing difficulties, what problem should you suspect?
a. Airway obstruction
b. Epileptic seizure
c. Serious allergic reaction
d. Carbon monoxide poisoning

LEARNING OBJECTIVE for items 5-24 thru 5-32: Using information in chapters 2,7, and 9, identify the life-threatening condition described in each question and, if required, recommend the appropriate first aid procedures.

5-24. A class C electrical fire has been reported in the Berthing area. SN Smith is found lying on the deck and not breathing. What is the first thing you should do?
a. Immediately begin artificial ventilation.
b. Cut off the main electrical switch.
c. Call damage control for more assistance.
d. Transport him to sick bay immediately.

5-25. In the situation described in question 5-24, what could have caused Smith to stop breathing?
a. Barbiturate overdose
b. Electrical shock
c. Airway blockage
d. Hysterical fear

5-26. First aid for first-degree burns on the face and hands should include observation for
a. blisters.
b. breathing problems.
c. hysteria.
d. blindness.

5-27. BM3 Shifty was playing poker when he suddenly complains of chest pain and passes out. You are unable to feel a carotid pulse and he does not respond when you shake him. What should you suspect?
a. Cardiac arrest
b. Respiratory failure
c. Indigestion
d. Apoplexy

5-28. As you approach the victim of a hit-and-run accident, you notice a large wound on his lower right jaw. The bone appears shattered and the wound is bleeding profusely. You should immediately check for
a. avulsed tissue.
b. foreign body obstruction.
c. lockjaw.
d. nausea and vomiting.

5-29. While making rounds, a damage control party discovers serious flooding in a lower compartment. QM2 Doe slips, strikes his head, and is knocked unconscious. He is quickly rescued from the water but is not breathing. To prevent brain damage, artificial ventilation must be started
   a. as soon as he is removed from the water.
   b. as soon as he is removed from the compartment.
   c. within 4 minutes.
   d. between 5 and 10 minutes.

5-30. If artificial ventilation is not quickly administered in the situation described in question 5-29, what problem can you expect to develop next?
   a. Hearing loss
   b. Fractured skull
   c. Accidental drowning
   d. Cardiac arrest

5-31. An electrician is repairing an electrical cable and comes in contact with a hot wire. He receives an electrical shock, and remains in contact with the hot wire. He has stopped breathing and his heart has stopped beating. Which of the following must you do first?
   a. Shut off the power to the hot line.
   b. Begin cardiopulmonary resuscitation.
   c. Immediately alert medical personnel.
   d. Protect the victim from further injuries.

5-32. ET3 Fuse has received severe electrical burns while working with a generator. Before treating the burns, observe him for signs of
   a. internal hemorrhage.
   b. mental confusion.
   c. cardiorespiratory failure.
   d. a grand mal seizure.

LEARNING OBJECTIVE for item 5-33: Using information from chapter 9, identify the common medical emergency and recommended first aid for the given situation.

5-33. YN1 Delicate passed out when she heard that her father had been seriously injured in an accident. What should you do first?
   a. Call the chaplain.
   b. Call an ambulance.
   c. Administer artificial ventilation.
   d. Quickly check her for injuries.

LEARNING OBJECTIVE for item 5-34: Identify the possible type of injury and recommended first aid monitoring measures using information in chapters 4, 5, and 6.

5-34. TM2 Tube hit the side of his head and was knocked unconscious when his sub made an emergency dive. What should you do until the corpsman arrives?
   a. Position him on his back with a pillow under his neck for support.
   b. Apply a pressure dressing to the injured side of his head.
   c. Place him in the shock position.
   d. Check his breathing and pulse often, and watch for vomiting.

LEARNING OBJECTIVE for items 5-35 and 5-36: Using information in chapter 7, identify the heat injury and the recommended immediate treatment for the given situation.

5-35. During a shell burst, a man was hit on the hand by a spray of white phosphorus. Some of the particles were partially embedded. What is the first thing to do in treating this type of burn?
   a. Flush with large amounts of water only.
   b. Pick off the particles of phosphorus while flushing.
   c. Apply a dry, sterile dressing.
   d. Apply a moist, sterile dressing.

5-36. FN Steam collapses while working in the boiler room. His skin feels very warm and is red and dry. He is probably suffering from
   a. heat exhaustion.
   b. heatstroke.
   c. carbon monoxide poisoning.
   d. carbon dioxide poisoning.

LEARNING OBJECTIVE for items 5-37 thru 5-43: Identify the injury, complications, and recommended first aid for given situations, using information in chapter 6.

5-37. A broken pipe has been reported in the galley. MR3 Bolt of the repair party slips on a ladder and falls to the deck. His lower left leg is swollen and disfigured. What injury should you suspect?
   a. Closed fracture
   b. Compound fracture
   c. Sprained ankle
   d. Dislocated knee

5-38. What first aid measure is appropriate for conditions in question 5-37?
   a. Elevate the extremity.
   b. Apply ice packs.
   c. Immobilize the leg.
   d. Attempt to reset the defect.

5-39. SN Slide injured his knee while playing softball. The knee is swollen, discolored, and very painful to move. What first aid should you administer?
   a. Immobilize the knee with a buttock to heel splint.
   b. Apply a tight elastic bandage to the knee.
   c. Have the victim exercise the injured knee vigorously.
   d. Apply heat to the knee as soon as possible.

5-40. While rushing to the scene of a fire, a fireman falls down a ladder and strikes head. His head appears to be caved in. He is unconscious, but breathing. What is the probable cause of unconsciousness?
   a. Epileptic seizure
   b. Skull fracture
   c. Brain tumor
   d. Smoke inhalation

5-41. During a severe storm, ST3 Mill slips on the wet deck striking his neck on a table. He complains of severe pain in the neck. What is the probable cause of pain?
   a. Collarbone fracture
   b. Whiplash injury
   c. Severe skull fracture
   d. Fractured neck

5-42. In the described situation in question 5-41, what other injury should you look for?
   a. Thermal burns
   b. Spinal damage
   c. Internal bleeding
   d. Dislocated shoulder

5-43. In the situation described in question 5-41, what first aid should you administer immediately?
   a. Have the victim try to touch his chest with his chin.
   b. Place the victim in a semisitting position.
   c. Apply a sling and swathe to immobilize the area.
   d. Immobilize the neck with improvised materials.

LEARNING OBJECTIVE for items 5-44 and 5-45: Identify in the order of life-threatening priorities the problems that should be treated in the given situations. Use information in chapters 5 and 6.

5-44. During an explosion a man suffers an open fracture of the upper leg. What should you do first?
   a. Administer artificial ventilation.
   b. Administer CPR.
   c. Control the bleeding.
   d. Treat for shock.

5-45. In the situation presented in question 5-44, what other critical problems should you anticipate?
   a. Shock
   b. Infection
   c. Cardiac arrest
   d. Respiratory failure

LEARNING OBJECTIVE for items 5-46 and 5-47: Using information in chapter 3, identify the problem and initial first aid management recommended for the given situation.

5-46. During recreation activity, LT Wills falls on the edge of a jagged fence. Bright, red blood is spurting from his upper leg. What is the probable cause of hemorrhage?
   a. Crushed tissue
   b. Lacerated muscle
   c. Torn vein
   d. Torn artery

5-47. Which method of hemorrhage control should you use first for the situation described in question 5-46?
   a. Elevate the affected extremity.
   b. Apply a firm pressure dressing.
   c. Apply a tourniquet.
   d. Pack the leg in ice.

LEARNING OBJECTIVE for item 5-48: Identify the most effective method of controlling hemorrhage in cases of traumatic amputations.

5-48. While fighting a fuel fire on deck, GM1 Martin's leg is ripped off below the knee in an explosion. What type of hemorrhage control should you use?
   a. Tourniquet above the bleeding
   b. Digital pressure at the groin
   c. Battle dressing at the site
   d. Elevate extremity

LEARNING OBJECTIVE for item 5-49: Using information in chapter 5, identify a problem that frequently accompanies blast injuries.

5-49. A man is conscious and alert after sustaining a blast injury. There are no obvious thermal burns. What other injury should you look for?
- a. Internal injuries
- b. Radiation injuries
- c. Carbon monoxide poisoning
- d. Carbon dioxide poisoning

LEARNING OBJECTIVE for items 5-50 and 5-51: Using information from chapter 6, identify the probable injury and first aid procedures for the given situations.

5-50. HN Payne is pinned under a beam that has fallen on the right side of his chest. He is coughing up blood and he has trouble breathing. After removing the beam, what should you do immediately?
- a. Place him in a sitting position to aid breathing.
- b. Apply a swathe bandage and evacuate him quickly.
- c. Leave him flat with his head turned to one side.
- d. Maintain an airway, and position him on his injured side.

5-51. AC1 Jock injures his back during football practice. He complains of severe shooting pains in his back and a numbing sensation down his left leg. What first aid should you administer?
- a. Immobilize and elevate his left leg.
- b. Place him flat on his back and keep him warm.
- c. Place him on his stomach and keep him warm.
- d. Apply cold packs to his back immediately.

PART II

SITUATIONAL PROBLEMS

LEARNING OBJECTIVE for items 5-52 thru 5-55: Identify the cold injury problems and appropriate first aid procedures in the given situations.

Information for items 5-52 thru 5-55: While on winter training maneuvers off the Alaskan coast, you lead a shore party on an inland reconnaissance. Due to operational commitments, the members of your unit had little sleep the night before and no breakfast. While ashore, a storm develops rapidly, dropping the temperature and bringing wind and sleet. You notice that some of your men are shivering severely. Shortly, BM3 Macho drops out of the column and complains of being tired and sleepy. His eyes look glassy and his breathing is slow and shallow.

5-52. From BM3 Macho's behavior, what would you suspect his problem is?
- a. Laziness
- b. Frostbite
- c. Hypothermia
- d. Lethargy

5-53. You can best help BM3 Macho by
- a. building a bonfire and offering him a drink of medicinal brandy.
- b. providing a shelter and warm nonalcoholic drinks.
- c. letting him rest in a sleeping bag until the unit returns from the mission.
- d. increasing the pace to stimulate heat production.

5-54. While awaiting assistance in evacuating BM3 Macho, what medical problem should you attempt to prevent?
- a. Frostbite
- b. Chilblains
- c. Immersion foot
- d. Snow blindness

5-55. Because of the storm, the evacuation of BM3 Macho will be delayed for hours. His condition is getting worse. After finding shelter for the shore party, what is the best way to help Macho?
- a. Building a bonfire near his sleeping bag
- b. Giving him warm food
- c. Skin-to-skin buddy warming
- d. Massaging his body to stimulate natural heat production

LEARNING OBJECTIVE for items 5-56 thru 5-58: Identify the principles of first aid priorities and appropriate first aid procedures in the given situations.

Information for items 5-56 thru 5-58: Your ship has been involved in a serious collision. Your damage control team finds three victims in a berthing area. "A" is bleeding heavily from a wound in his arm. "B" was knocked unconscious but appears stable. "C" is pinned by fallen debris but otherwise unhurt. You are assigned to aid these men while the damage control team moves on.

5-56. After quickly checking all three men, whom should you aid first?
- a. A
- b. B
- c. C
- d. The senior man

5-57. "B" suddenly stops breathing. Your first move should be to
- a. begin artificial ventilation.
- b. start cardiac massage.
- c. tilt his head back.
- c. call for medical assistance.

5-58. After your ship makes an unusual movement, "C" becomes hysterical because he fears that the ship is about to sink and he will die. You should
- a. call damage control central to see if "C" is correct.
- b. make light jokes to convince him that there is no danger.
- c. quickly get help to remove the debris pinning him.
- d. talk with him in a calm, reassured manner until help arrives.

PART III

TRUE-FALSE ITEMS

5-59. If the victim has swallowed gasoline, the rescuer should try to make him vomit.

5-60. Large quantities of alcohol can cause death by paralyzing the breathing center of the brain.

5-61. The primary reason for splinting is to prevent motion of the bone fragments or the dislocated joint.

5-62. In performing CPR, place the heel of one hand directly over the lowest part of the sternum.

5-63. Shivering is an attempt by the body to lose heat.

PART IV

MATCHING ITEMS

ITEMS 5-64 thru 5-75: The nonmedical person who becomes involved in a situation which requires the administration of first aid will frequently be exposed to certain descriptive medical terms. In the following matching exercises, Column B lists medical terms found in the glossary. Column A is a simple description of the term. Match the medical term in Column B with the appropriate description in Column A.

COLUMN A	COLUMN B
5-64. Bluish discoloration of the skin due to a lack of oxygen in the blood	a. Clammy b. Cyanosis c. Flush d. Frothy
5-65. Bubbly or foamy	
5-66. Damp or cool	
5-67. Sudden redness of the skin	

COLUMN A	COLUMN B
5-68. To widen	a. To constrict b. To dilate c. To distend d. To contract
5-69. To narrow	
5-70. To shorten	
5-71. To inflate	

COLUMN A	COLUMN B
5-72. A small, circular elevation of the skin, usually filled with fluid	a. Blister b. Carbuncle c. Ulcer d. Abscess
5-73. A swollen, inflamed area of body tissue in which pus collects	
5-74. A red, pus-filled, swollen sore located on the skin and extending into the deep tissues	
5-75. An open sore on the skin or mucous membrane, which drains tissue fluid	

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